FIG. 1

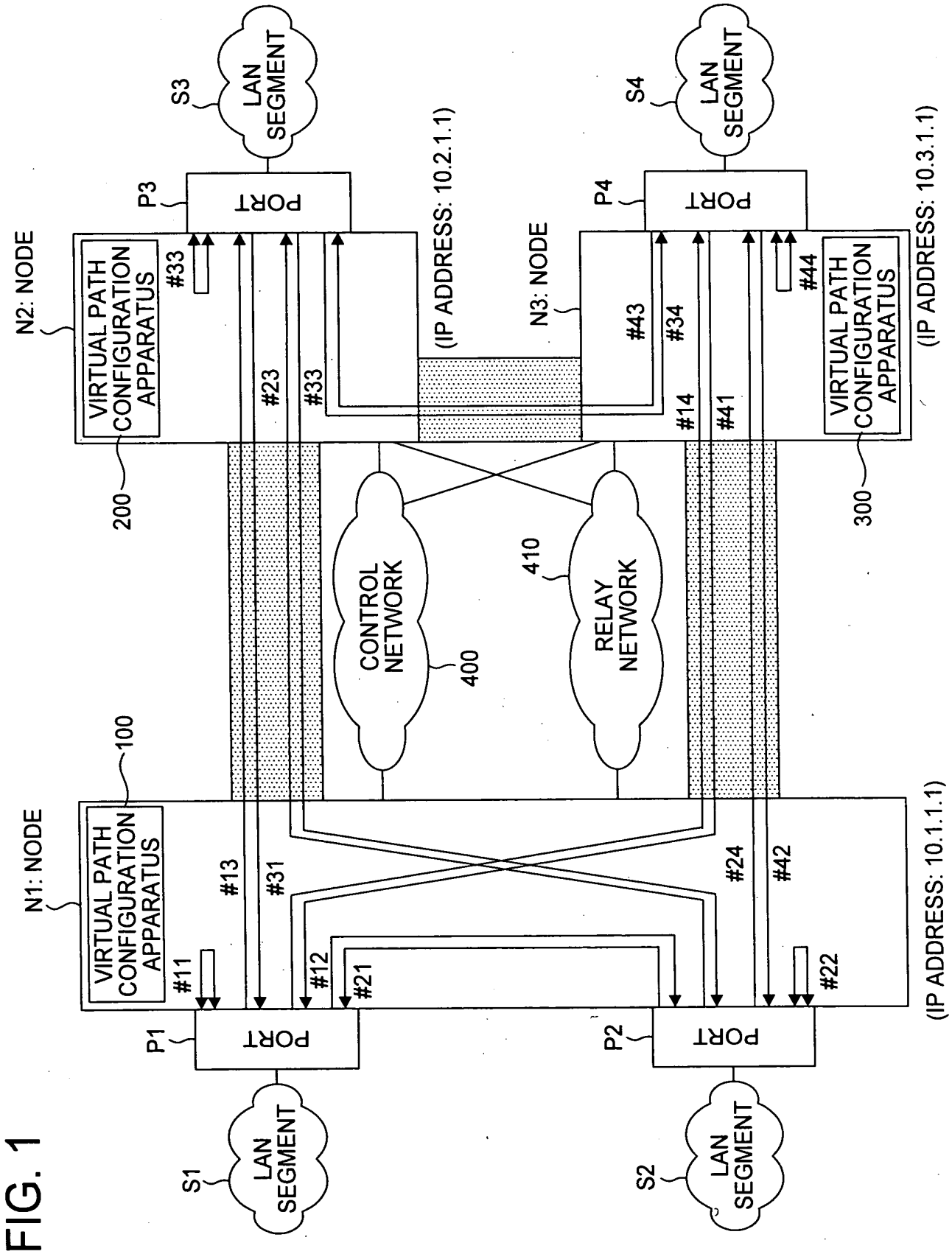

N1: NODE
VIRTUAL PATH CONFIGURATION APPARATUS
100
(IP ADDRESS: 10.1.1.1)
N2: NODE
VIRTUAL PATH CONFIGURATION APPARATUS
200
(IP ADDRESS: 10.2.1.1)
N3: NODE
VIRTUAL PATH CONFIGURATION APPARATUS
300
(IP ADDRESS: 10.3.1.1)
CONTROL NETWORK
400
RELAY NETWORK
410
P1
P2
P3
P4
PORT
S1
S2
S3
S4
LAN SEGMENT
#11
#12
#13
#21
#22
#23
#24
#31
#33
#34
#41
#42
#43
#44
#14

FIG. 2

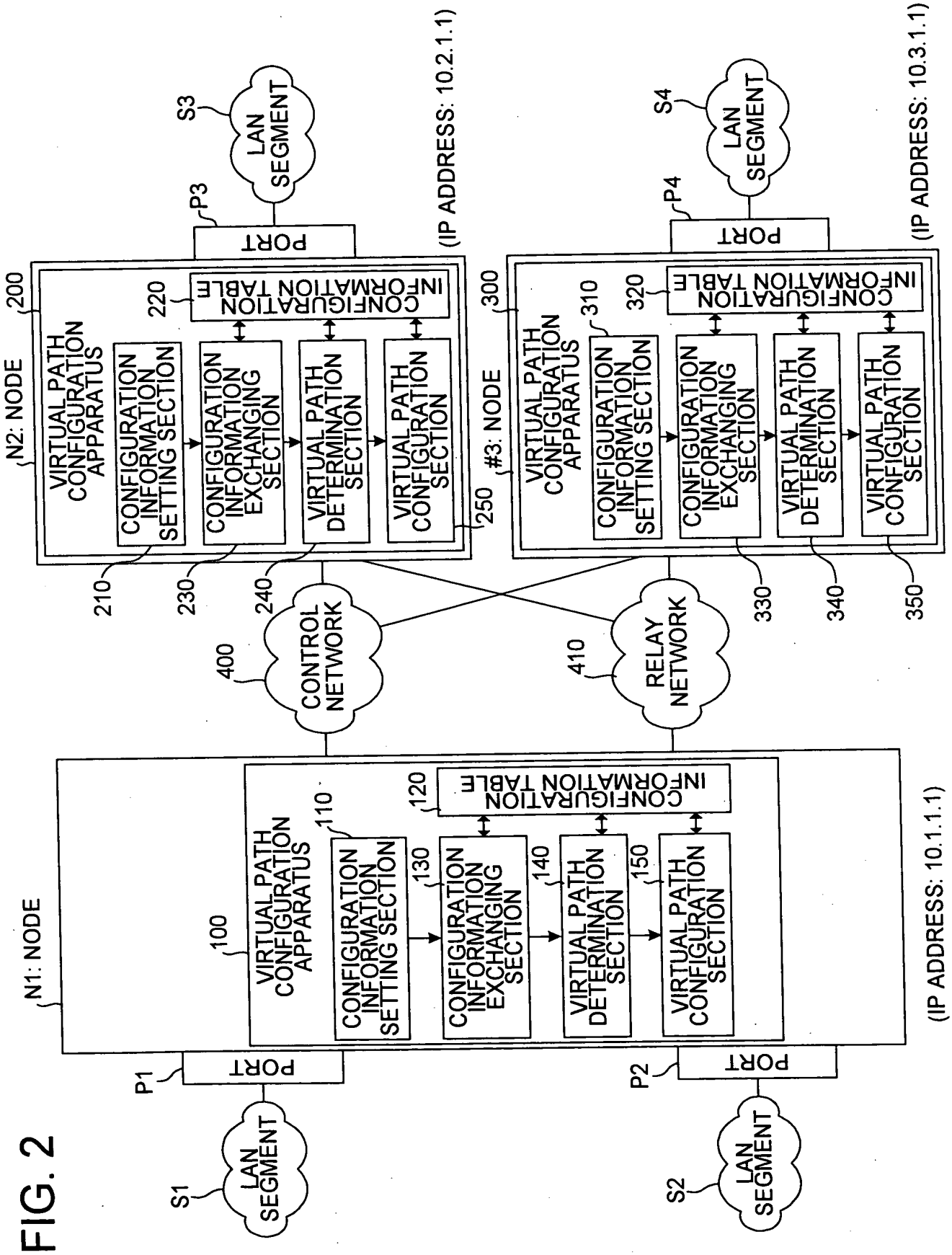

N1: NODE
100
VIRTUAL PATH CONFIGURATION APPARATUS
110
CONFIGURATION INFORMATION SETTING SECTION
130
CONFIGURATION INFORMATION EXCHANGING SECTION
140
VIRTUAL PATH DETERMINATION SECTION
150
VIRTUAL PATH CONFIGURATION SECTION
120
CONFIGURATION INFORMATION TABLE
(IP ADDRESS: 10.1.1.1)
P1
PORT
S1
LAN SEGMENT
P2
PORT
S2
LAN SEGMENT
N2: NODE
200
VIRTUAL PATH CONFIGURATION APPARATUS
210
CONFIGURATION INFORMATION SETTING SECTION
230
CONFIGURATION INFORMATION EXCHANGING SECTION
240
VIRTUAL PATH DETERMINATION SECTION
250
VIRTUAL PATH CONFIGURATION SECTION
220
CONFIGURATION INFORMATION TABLE
(IP ADDRESS: 10.2.1.1)
P3
PORT
S3
LAN SEGMENT
#3: NODE
300
VIRTUAL PATH CONFIGURATION APPARATUS
310
CONFIGURATION INFORMATION SETTING SECTION
330
CONFIGURATION INFORMATION EXCHANGING SECTION
340
VIRTUAL PATH DETERMINATION SECTION
350
VIRTUAL PATH CONFIGURATION SECTION
320
CONFIGURATION INFORMATION TABLE
(IP ADDRESS: 10.3.1.1)
P4
PORT
S4
LAN SEGMENT
400
CONTROL NETWORK
410
RELAY NETWORK

FIG. 3

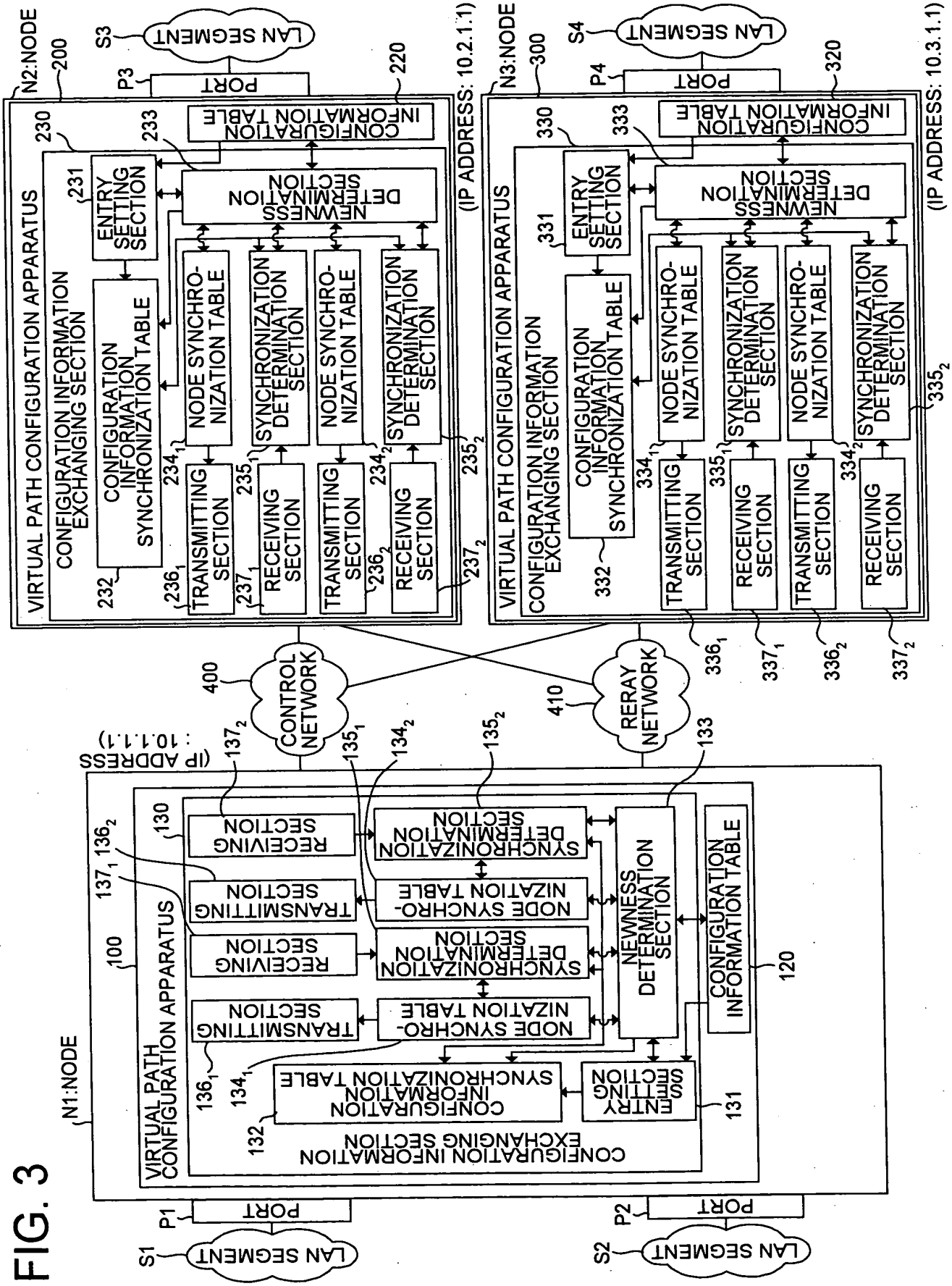

N1:NODE
VIRTUAL PATH CONFIGURATION APPARATUS
CONFIGURATION INFORMATION EXCHANGING SECTION
CONFIGURATION INFORMATION TABLE
ENTRY SETTING SECTION
NEWNESS DETERMINATION SECTION
NODE SYNCHRONIZATION TABLE
SYNCHRONIZATION DETERMINATION SECTION
TRANSMITTING SECTION
RECEIVING SECTION
P1
P2
P3
P4
PORT
S1
S2
S3
S4
LAN SEGMENT
CONTROL NETWORK
RERAY NETWORK
N2:NODE
N3:NODE
(IP ADDRESS: 10.1.1.1)
(IP ADDRESS: 10.2.1.1)
(IP ADDRESS: 10.3.1.1)

FIG.4

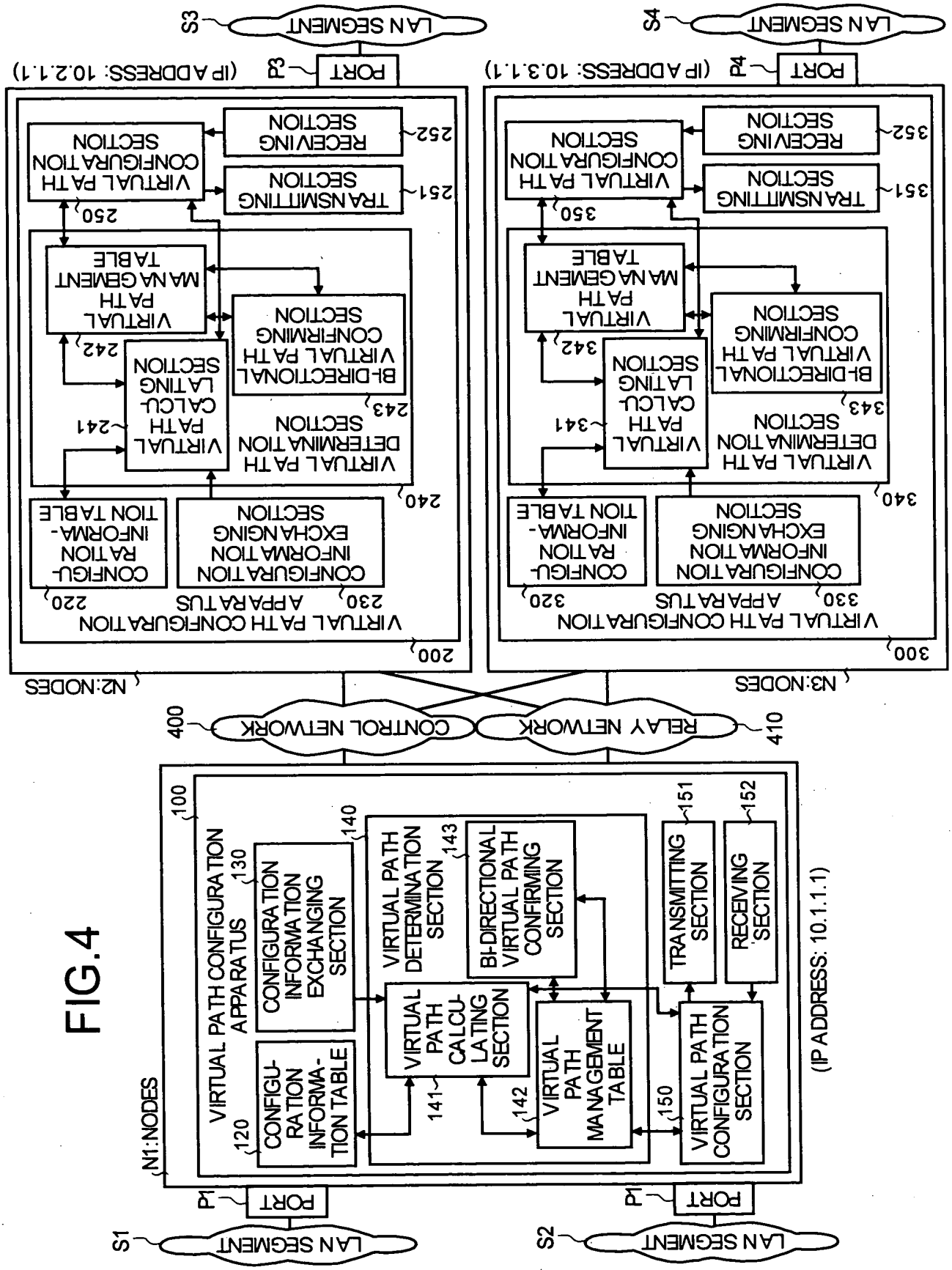

N1:NODES
100
VIRTUAL PATH CONFIGURATION APPARATUS
CONFIGURATION INFORMATION EXCHANGING SECTION
130
CONFIGURATION INFORMATION TABLE
120
VIRTUAL PATH DETERMINATION SECTION
140
VIRTUAL PATH CALCULATING SECTION
141
BI-DIRECTIONAL VIRTUAL PATH CONFIRMING SECTION
143
VIRTUAL PATH MANAGEMENT TABLE
142
TRANSMITTING SECTION
151
RECEIVING SECTION
152
VIRTUAL PATH CONFIGURATION SECTION
150
(IP ADDRESS: 10.1.1.1)
P1
PORT
LAN SEGMENT
S1
S2
CONTROL NETWORK
400
RELAY NETWORK
410
N2:NODES
200
VIRTUAL PATH CONFIGURATION
APPARATUS
230
CONFIGURATION INFORMATION EXCHANGING SECTION
CONFIGURATION INFORMATION TABLE
220
VIRTUAL PATH DETERMINATION SECTION
240
VIRTUAL PATH CALCULATING SECTION
241
BI-DIRECTIONAL VIRTUAL PATH CONFIRMING SECTION
243
VIRTUAL PATH MANAGEMENT TABLE
242
TRANSMITTING SECTION
251
RECEIVING SECTION
252
VIRTUAL PATH CONFIGURATION SECTION
250
(IP ADDRESS: 10.2.1.1)
P3
PORT
LAN SEGMENT
S3
N3:NODES
300
VIRTUAL PATH CONFIGURATION
APPARATUS
330
CONFIGURATION INFORMATION EXCHANGING SECTION
CONFIGURATION INFORMATION TABLE
320
VIRTUAL PATH DETERMINATION SECTION
340
VIRTUAL PATH CALCULATING SECTION
341
BI-DIRECTIONAL VIRTUAL PATH CONFIRMING SECTION
343
VIRTUAL PATH MANAGEMENT TABLE
342
TRANSMITTING SECTION
351
RECEIVING SECTION
352
VIRTUAL PATH CONFIGURATION SECTION
350
(IP ADDRESS: 10.3.1.1)
P4
PORT
LAN SEGMENT
S4

FIG. 5

120: CONFIGURATION INFORMATION TABLE

NODE	PORT
N1(10. 1. 1. 1)	P1
N1(10. 1. 1. 1)	P2
N2(10. 2. 1. 1)	P3

(a)

ADD

121: CONFIGURATION INFORMATION

N3(10. 3. 1. 1)	P4

(d)

120: CONFIGURATION INFORMATION TABLE

NODE	PORT
N1(10. 1. 1. 1)	P1
N1(10. 1. 1. 1)	P2
N2(10. 2. 1. 1)	P3
N3(10. 3. 1. 1)	P4

(g)

220: CONFIGURATION INFORMATION TABLE

NODE	PORT
N1(10. 1. 1. 1)	P1
N1(10. 1. 1. 1)	P2
N2(10. 2. 1. 1)	P3

(b)

ADD

221: CONFIGURATION INFORMATION

N3(10. 3. 1. 1)	P4

(e)

220: CONFIGURATION INFORMATION TABLE

NODE	PORT
N1(10. 1. 1. 1)	P1
N1(10. 1. 1. 1)	P2
N2(10. 2. 1. 1)	P3
N3(10. 3. 1. 1)	P4

(h)

320: CONFIGURATION INFORMATION TABLE

NODE	PORT
UNSET	UNSET

(c)

ADD

321: CONFIGURATION INFORMATION

N1(10. 1. 1. 1)	P1
N1(10. 1. 1. 1)	P2
N2(10. 2. 1. 1)	P3
N3(10. 3. 1. 1)	P4

(f)

320: CONFIGURATION INFORMATION TABLE

NODE	PORT
N1(10. 1. 1. 1)	P1
N1(10. 1. 1. 1)	P2
N2(10. 2. 1. 1)	P3
N3(10. 3. 1. 1)	P4

(i)

FIG. 6

132: CONFIGURATION INFORMATION SYNCHRONIZATION TABLE

NODE	PORT	ADDITION/DELETION FLAG	SYNCHRONIZATION FLAG
N1(10. 1. 1. 1)	P1	1	0
N1(10. 1. 1. 1)	P2	1	0
N2(10. 2. 1. 1)	P3	1	0

1: ADD 1: SYNCHRONIZED

0: DELETE 0: ASYNCHRONOUS

134_1: NODE SYNCHRONIZATION TABLE (CORRESPONDING TO NODE N2)

NODE	PORT	ADDITION/DELETION FLAG	SYNCHRONIZATION FLAG
N1(10. 1. 1. 1)	P1	1	0
N1(10. 1. 1. 1)	P2	1	0
N2(10. 2. 1. 1)	P3	1	0

134_2: NODE SYNCHRONIZATION TABLE (CORRESPONDING TO NODE N3)

NODE	PORT	ADDITION/DELETION FLAG	SYNCHRONIZATION FLAG
UNSET	UNSET	UNSET	UNSET

FIG. 7

132: CONFIGURATION INFORMATION SYNCHRONIZATION TABLE

NODE	PORT	ADDITION/DELETION FLAG	SYNCHRONIZATION FLAG
N1(10. 1. 1. 1)	P1	1	1
N1(10. 1. 1. 1)	P2	1	1
N2(10. 2. 1. 1)	P3	1	1
N3(10. 3. 1. 1)	P4	1	0

ADD

1: ADD 1: SYNCHRONIZED
0: DELETE 0: ASYNCHRONOUS

134_1: NODE SYNCHRONIZATION TABLE
(CORRESPONDING TO NODE N2)

NODE	PORT	ADDITION/DELETION FLAG	SYNCHRONIZATION FLAG
N1(10. 1. 1. 1)	P1	1	0
N1(10. 1. 1. 1)	P2	1	0
N2(10. 2. 1. 1)	P3	1	0
N3(10. 3. 1. 1)	P4	1	0

134_2: NODE SYNCHRONIZATION TABLE
(CORRESPONDING TO NODE N3)

NODE	PORT	ADDITION/DELETION FLAG	SYNCHRONIZATION FLAG
N1(10. 1. 1. 1)	P1	1	0
N1(10. 1. 1. 1)	P2	1	0
N2(10. 2. 1. 1)	P3	1	0
N3(10. 3. 1. 1)	P4	1	0

FIG. 8

142

142R

RECEPTION VIRTUAL PATH	STARTING POINT NODE	STARTING POINT PORT	END POINT NODE	END POINT PORT	USABLE FLAG
#11	N1(10.1.1.1)	P1	N1(10.1.1.1)	P1	
#21	N1(10.1.1.1)	P2	N1(10.1.1.1)	P1	
#31	N2(10.2.1.1)	P3	N1(10.1.1.1)	P1	
#41	N3(10.3.1.1)	P4	N1(10.1.1.1)	P1	
#12	N1(10.1.1.1)	P1	N1(10.1.1.1)	P2	
#22	N1(10.1.1.1)	P2	N1(10.1.1.1)	P2	
#32	N2(10.2.1.1)	P3	N1(10.1.1.1)	P2	
#42	N3(10.3.1.1)	P4	N1(10.1.1.1)	P2	

142S

STARTING POINT NODE	STARTING POINT PORT	END POINT NODE	END POINT PORT	TRANSMISSION VIRTUAL PATH	USABLE FLAG
N1(10.1.1.1)	P1	N1(10.1.1.1)	P1	#11	
N1(10.1.1.1)	P1	N1(10.1.1.1)	P2	#12	
N1(10.1.1.1)	P1	N2(10.2.1.1)	P3	#13	
N1(10.1.1.1)	P1	N3(10.3.1.1)	P4	#14	
N1(10.1.1.1)	P2	N1(10.1.1.1)	P1	#21	
N1(10.1.1.1)	P2	N1(10.1.1.1)	P2	#22	
N1(10.1.1.1)	P2	N2(10.2.1.1)	P3	#23	
N1(10.1.1.1)	P2	N3(10.3.1.1)	P4	#24	

FIG. 9

242

242R

RECEPTION VIRTUAL PATH IDENTIFIER	STARTING POINT NODE	STARTING POINT PORT	END POINT NODE	END POINT PORT	USABLE FLAG
#13	N1(10.1.1.1)	P1	N2(10.2.1.1)	P3	
#23	N1(10.1.1.1)	P2	N2(10.2.1.1)	P3	
#33	N2(10.2.1.1)	P3	N2(10.2.1.1)	P3	
#43	N3(10.3.1.1)	P4	N2(10.2.1.1)	P3	

242S

STARTING POINT NODE	STARTING POINT PORT	END POINT NODE	END POINT PORT IDENTIFIER	TRANSMISSION VIRTUAL PATH IDENTIFIER	USABLE FLAG
N2(10.2.1.1)	P3	N1(10.1.1.1)	P1	#31	
N2(10.2.1.1)	P3	N1(10.1.1.1)	P2	#32	
N2(10.2.1.1)	P3	N2(10.2.1.1)	P3	#33	
N2(10.2.1.1)	P3	N2(10.3.1.1)	P4	#34	

FIG. 10

342

342R

RECEPTION VIRTUAL PATH IDENTIFIER	STARTING POINT NODE	STARTING POINT PORT	END POINT NODE	END POINT PORT	USABLE FLAG
#14	N1(10.1.1.1)	N1	N3(10.3.1.1)	P4	
#24	N1(10.1.1.1)	Bport#2	N3(10.3.1.1)	P4	
#34	N2(10.2.1.1)	Bport#3	N3(10.3.1.1)	P4	
#44	N3(10.3.1.1)	Bport#4	N3(10.3.1.1)	P4	

342S

STARTING POINT NODE	STARTING POINT PORT	END POINT NODE	END POINT PORT	TRANSMISSION VIRTUAL PATH IDENTIFIER	USABLE FLAG
N3(10.3.1.1)	P4	N1(10.1.1.1)	P1	#41	
N3(10.3.1.1)	P4	N1(10.1.1.1)	P2	#42	
N3(10.3.1.1)	P4	N2(10.2.1.1)	P3	#43	
N3(10.3.1.1)	P4	N3(10.3.1.1)	P4	#44	

FIG.11

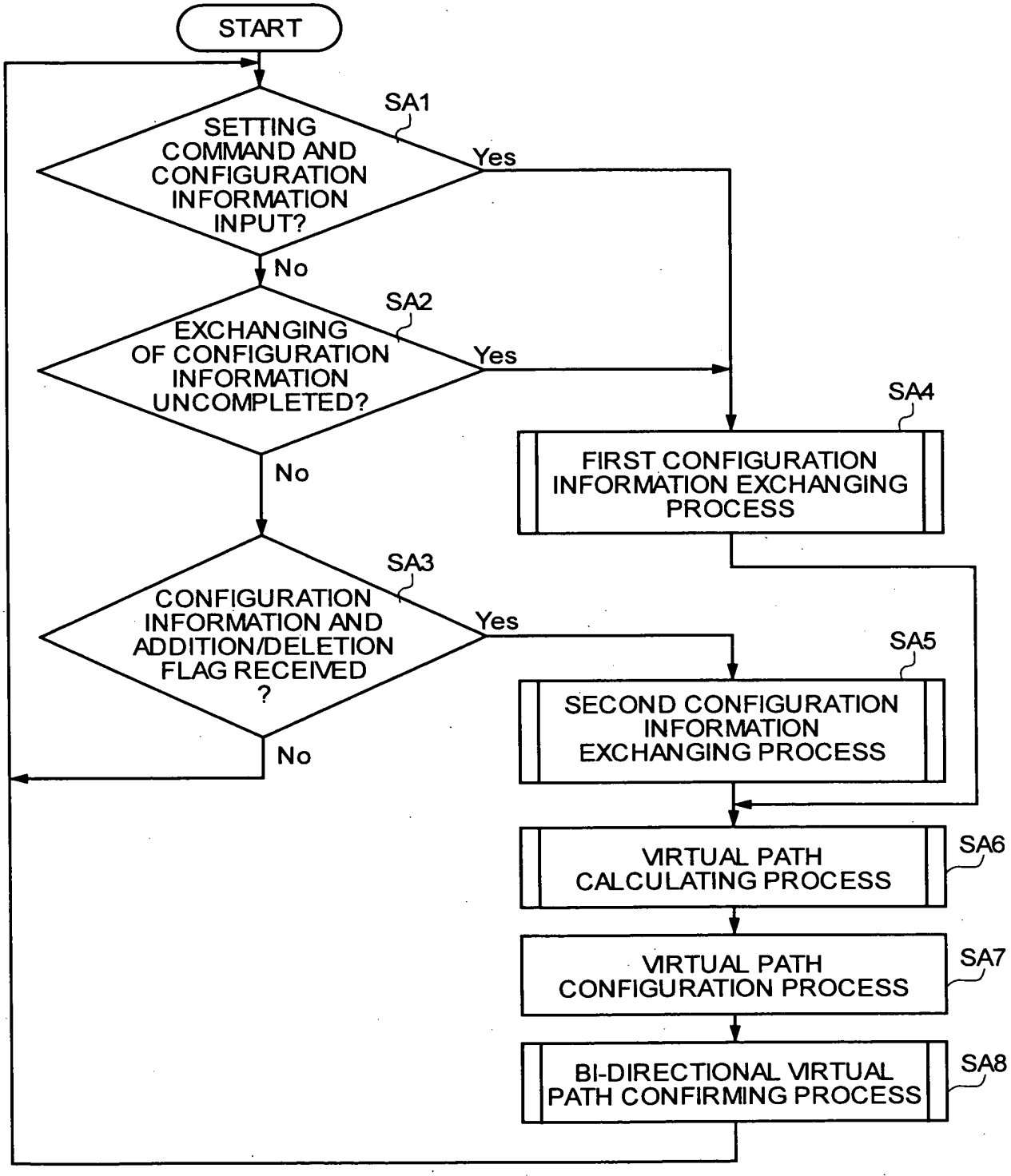

START
SA1
SETTING COMMAND AND CONFIGURATION INFORMATION INPUT?
Yes
No
SA2
EXCHANGING OF CONFIGURATION INFORMATION UNCOMPLETED?
Yes
No
SA3
CONFIGURATION INFORMATION AND ADDITION/DELETION FLAG RECEIVED ?
Yes
No
SA4
FIRST CONFIGURATION INFORMATION EXCHANGING PROCESS
SA5
SECOND CONFIGURATION INFORMATION EXCHANGING PROCESS
SA6
VIRTUAL PATH CALCULATING PROCESS
SA7
VIRTUAL PATH CONFIGURATION PROCESS
SA8
BI-DIRECTIONAL VIRTUAL PATH CONFIRMING PROCESS

FIG.12

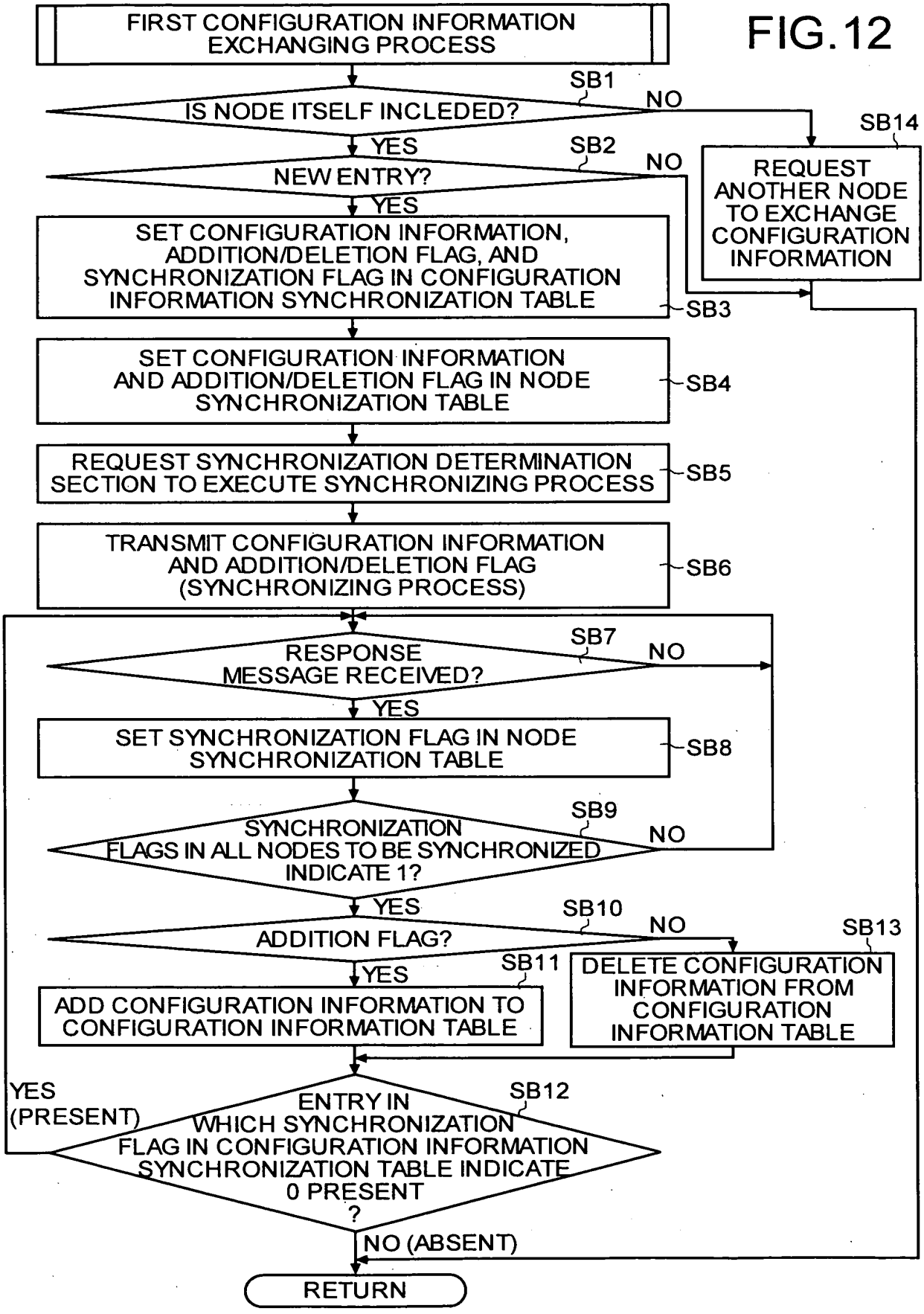

FIRST CONFIGURATION INFORMATION EXCHANGING PROCESS
SB1
IS NODE ITSELF INCLEDED?
NO
YES
SB14
REQUEST ANOTHER NODE TO EXCHANGE CONFIGURATION INFORMATION
SB2
NEW ENTRY?
NO
YES
SET CONFIGURATION INFORMATION, ADDITION/DELETION FLAG, AND SYNCHRONIZATION FLAG IN CONFIGURATION INFORMATION SYNCHRONIZATION TABLE
SB3
SET CONFIGURATION INFORMATION AND ADDITION/DELETION FLAG IN NODE SYNCHRONIZATION TABLE
SB4
REQUEST SYNCHRONIZATION DETERMINATION SECTION TO EXECUTE SYNCHRONIZING PROCESS
SB5
TRANSMIT CONFIGURATION INFORMATION AND ADDITION/DELETION FLAG (SYNCHRONIZING PROCESS)
SB6
SB7
RESPONSE MESSAGE RECEIVED?
NO
YES
SET SYNCHRONIZATION FLAG IN NODE SYNCHRONIZATION TABLE
SB8
SB9
SYNCHRONIZATION FLAGS IN ALL NODES TO BE SYNCHRONIZED INDICATE 1?
NO
YES
SB10
ADDITION FLAG?
NO
SB13
YES
SB11
ADD CONFIGURATION INFORMATION TO CONFIGURATION INFORMATION TABLE
DELETE CONFIGURATION INFORMATION FROM CONFIGURATION INFORMATION TABLE
YES (PRESENT)
SB12
ENTRY IN WHICH SYNCHRONIZATION FLAG IN CONFIGURATION INFORMATION SYNCHRONIZATION TABLE INDICATE 0 PRESENT ?
NO (ABSENT)
RETURN

FIG.13

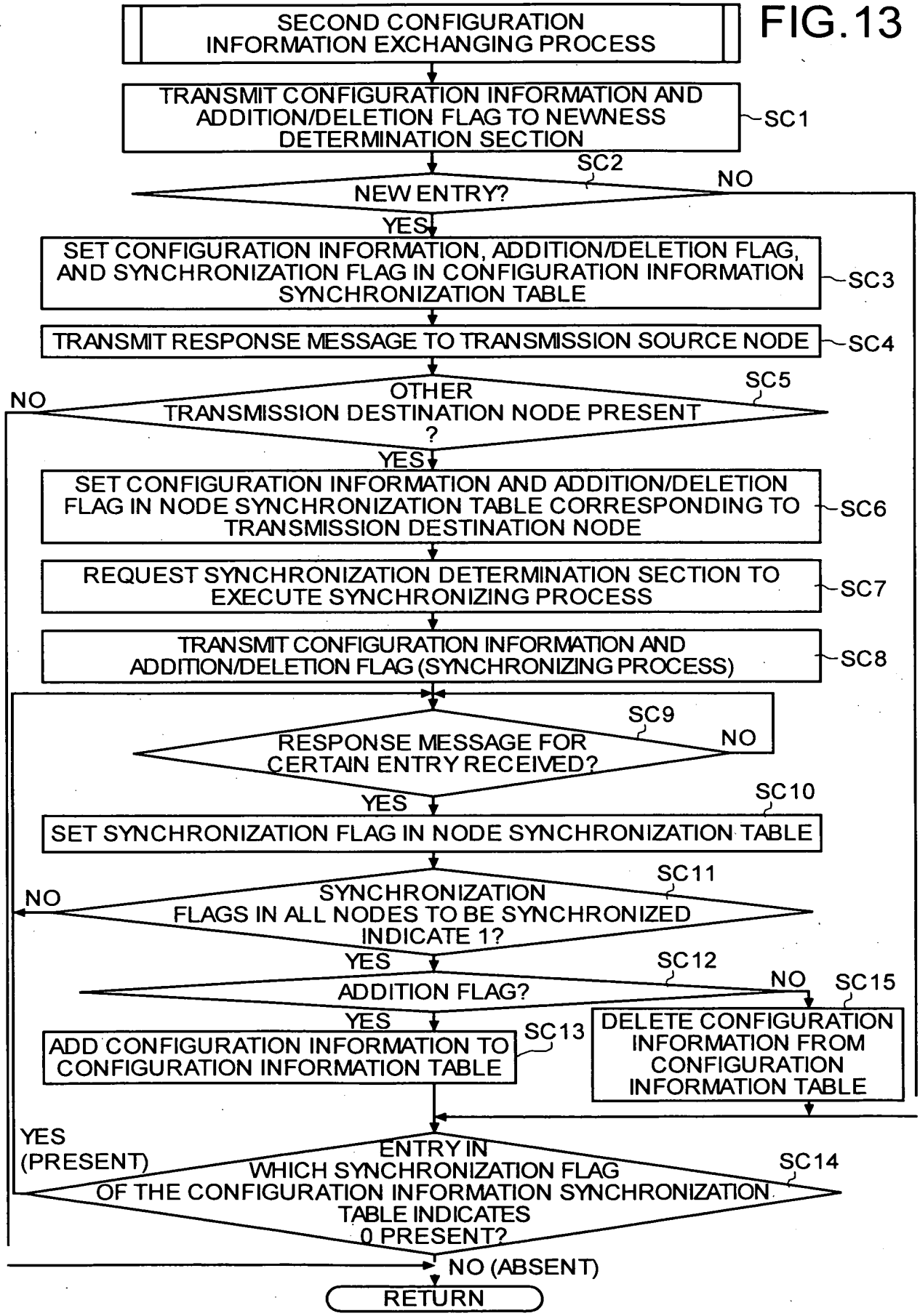

SECOND CONFIGURATION INFORMATION EXCHANGING PROCESS
TRANSMIT CONFIGURATION INFORMATION AND ADDITION/DELETION FLAG TO NEWNESS DETERMINATION SECTION
SC1
SC2
NEW ENTRY?
NO
YES
SET CONFIGURATION INFORMATION, ADDITION/DELETION FLAG, AND SYNCHRONIZATION FLAG IN CONFIGURATION INFORMATION SYNCHRONIZATION TABLE
SC3
TRANSMIT RESPONSE MESSAGE TO TRANSMISSION SOURCE NODE
SC4
SC5
NO
OTHER TRANSMISSION DESTINATION NODE PRESENT ?
YES
SET CONFIGURATION INFORMATION AND ADDITION/DELETION FLAG IN NODE SYNCHRONIZATION TABLE CORRESPONDING TO TRANSMISSION DESTINATION NODE
SC6
REQUEST SYNCHRONIZATION DETERMINATION SECTION TO EXECUTE SYNCHRONIZING PROCESS
SC7
TRANSMIT CONFIGURATION INFORMATION AND ADDITION/DELETION FLAG (SYNCHRONIZING PROCESS)
SC8
SC9
RESPONSE MESSAGE FOR CERTAIN ENTRY RECEIVED?
NO
YES
SC10
SET SYNCHRONIZATION FLAG IN NODE SYNCHRONIZATION TABLE
SC11
NO
SYNCHRONIZATION FLAGS IN ALL NODES TO BE SYNCHRONIZED INDICATE 1?
YES
SC12
ADDITION FLAG?
NO
SC15
YES
SC13
ADD CONFIGURATION INFORMATION TO CONFIGURATION INFORMATION TABLE
DELETE CONFIGURATION INFORMATION FROM CONFIGURATION INFORMATION TABLE
YES (PRESENT)
SC14
ENTRY IN WHICH SYNCHRONIZATION FLAG OF THE CONFIGURATION INFORMATION SYNCHRONIZATION TABLE INDICATES 0 PRESENT?
NO (ABSENT)
RETURN

FIG.14

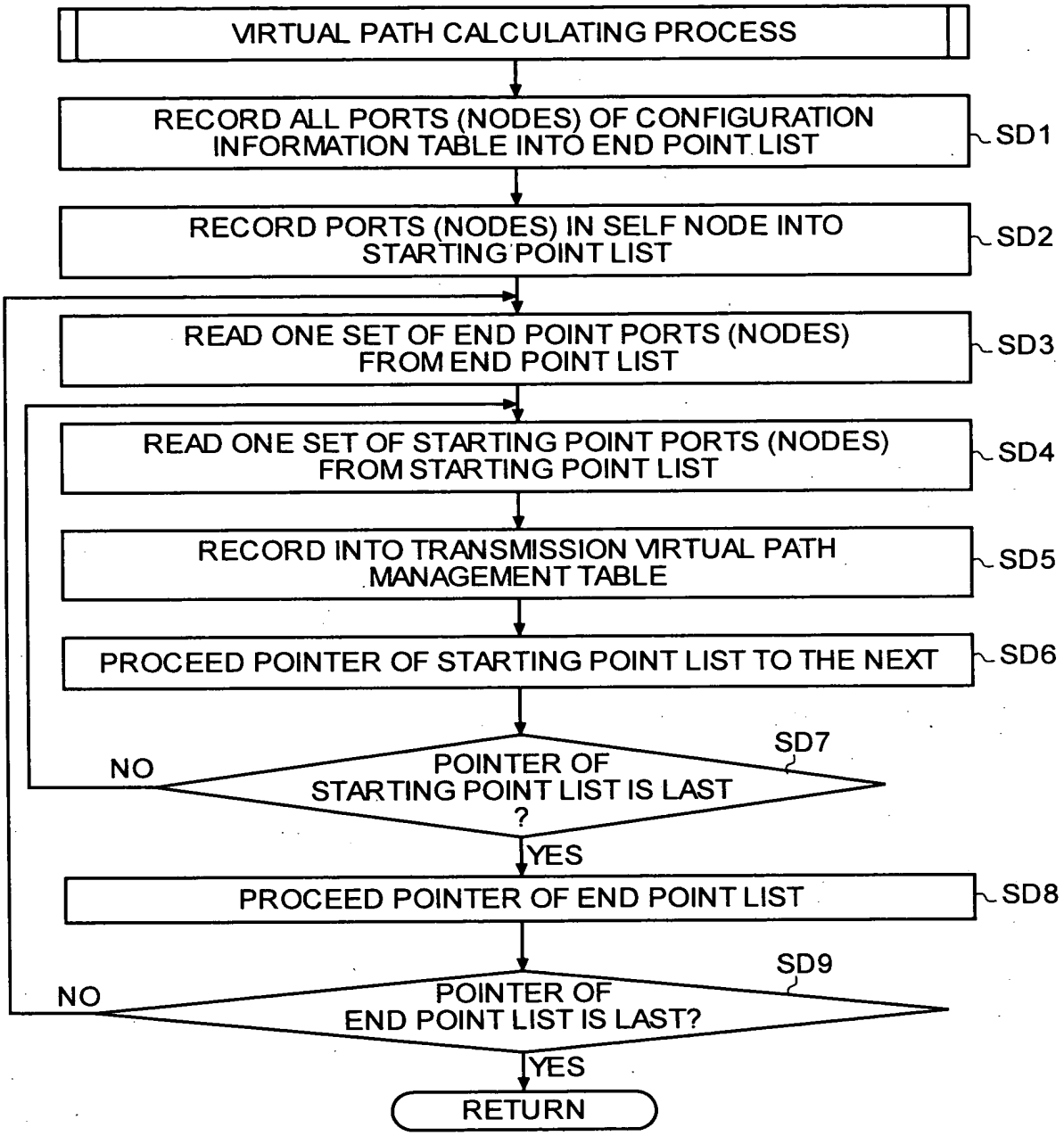

VIRTUAL PATH CALCULATING PROCESS
RECORD ALL PORTS (NODES) OF CONFIGURATION INFORMATION TABLE INTO END POINT LIST
SD1
RECORD PORTS (NODES) IN SELF NODE INTO STARTING POINT LIST
SD2
READ ONE SET OF END POINT PORTS (NODES) FROM END POINT LIST
SD3
READ ONE SET OF STARTING POINT PORTS (NODES) FROM STARTING POINT LIST
SD4
RECORD INTO TRANSMISSION VIRTUAL PATH MANAGEMENT TABLE
SD5
PROCEED POINTER OF STARTING POINT LIST TO THE NEXT
SD6
SD7
NO
POINTER OF STARTING POINT LIST IS LAST ?
YES
PROCEED POINTER OF END POINT LIST
SD8
SD9
NO
POINTER OF END POINT LIST IS LAST?
YES
RETURN

FIG.15

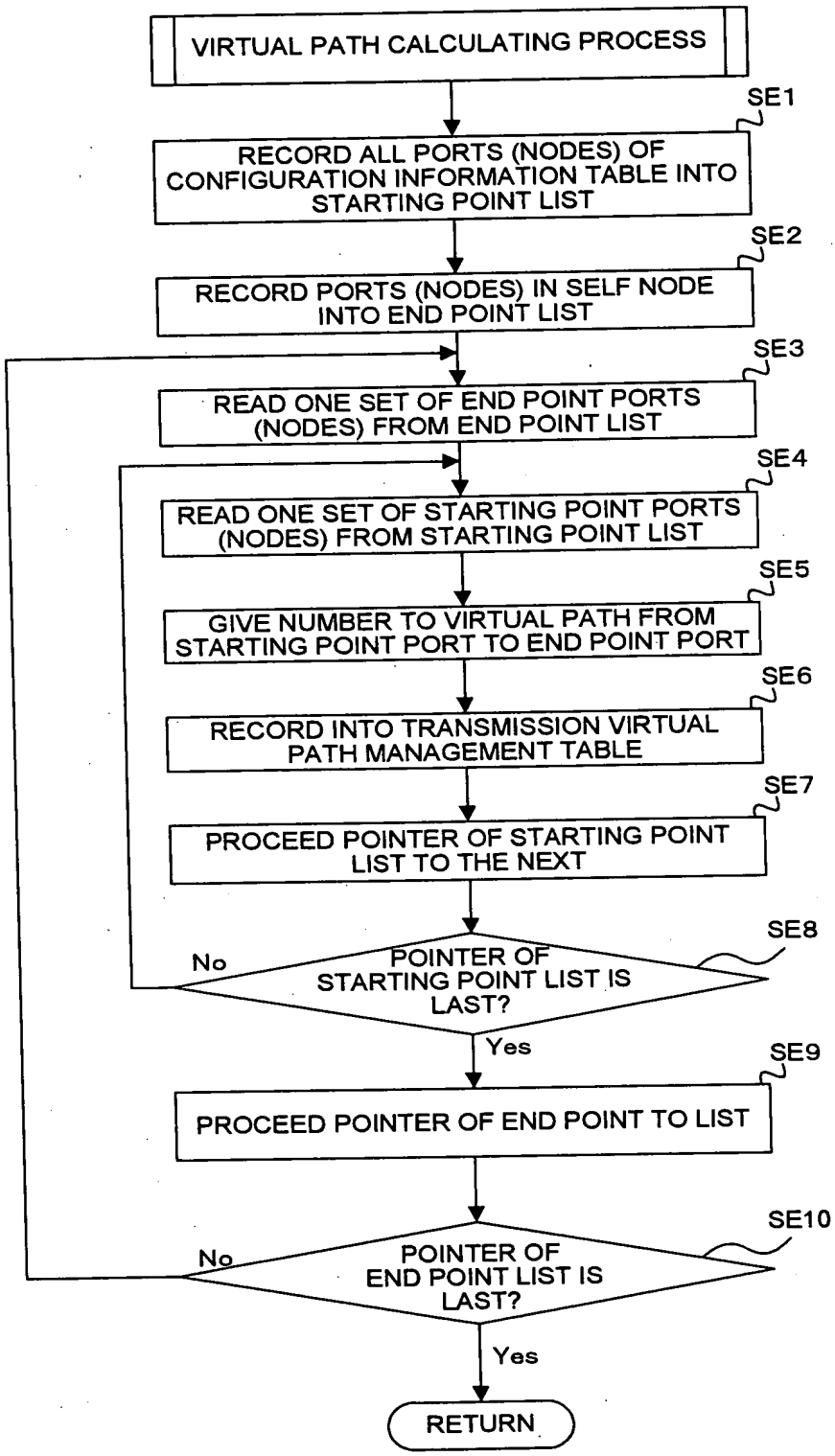

VIRTUAL PATH CALCULATING PROCESS
SE1
RECORD ALL PORTS (NODES) OF CONFIGURATION INFORMATION TABLE INTO STARTING POINT LIST
SE2
RECORD PORTS (NODES) IN SELF NODE INTO END POINT LIST
SE3
READ ONE SET OF END POINT PORTS (NODES) FROM END POINT LIST
SE4
READ ONE SET OF STARTING POINT PORTS (NODES) FROM STARTING POINT LIST
SE5
GIVE NUMBER TO VIRTUAL PATH FROM STARTING POINT PORT TO END POINT PORT
SE6
RECORD INTO TRANSMISSION VIRTUAL PATH MANAGEMENT TABLE
SE7
PROCEED POINTER OF STARTING POINT LIST TO THE NEXT
SE8
No
POINTER OF STARTING POINT LIST IS LAST?
Yes
SE9
PROCEED POINTER OF END POINT TO LIST
SE10
No
POINTER OF END POINT LIST IS LAST?
Yes
RETURN

FIG.16

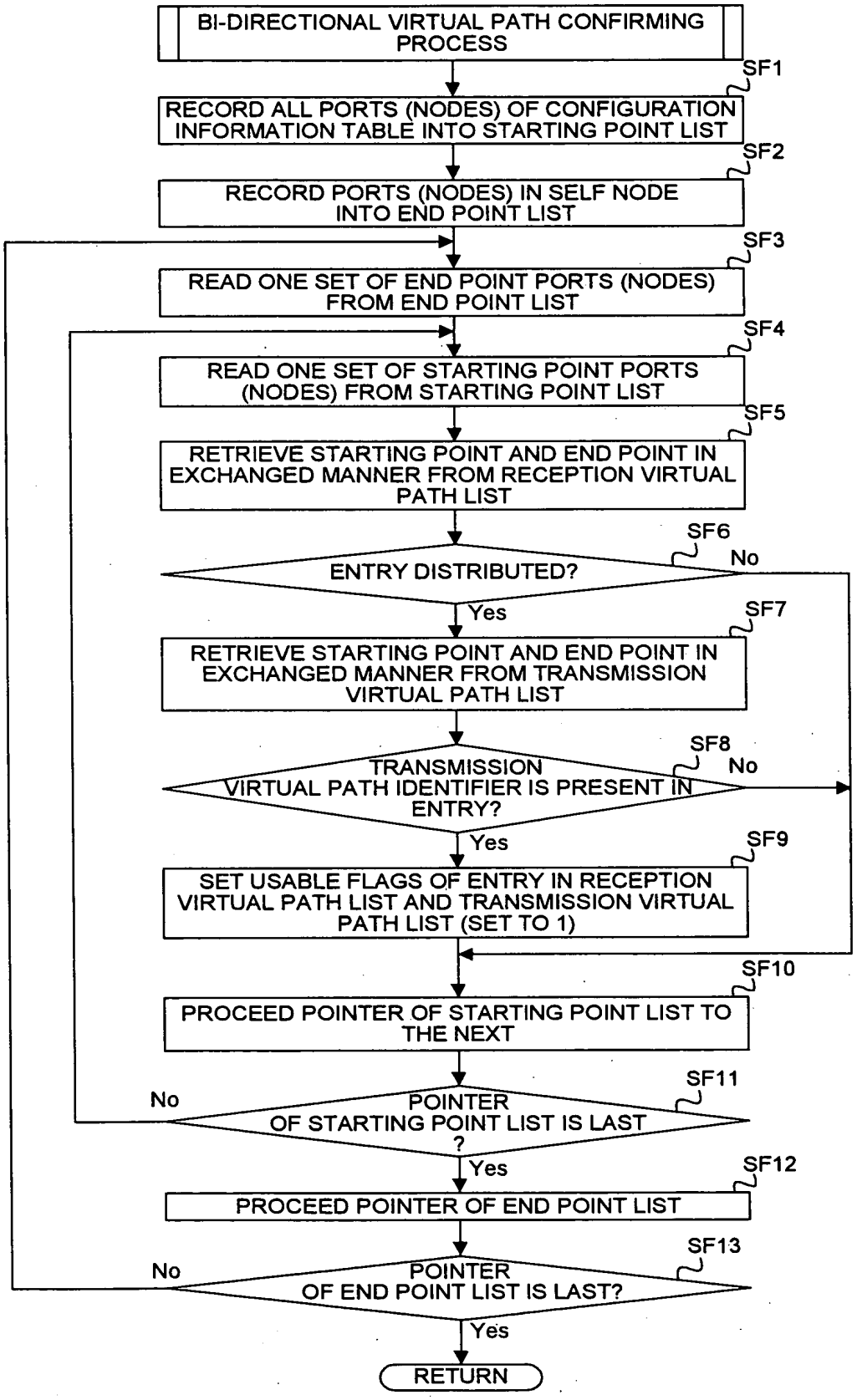

BI-DIRECTIONAL VIRTUAL PATH CONFIRMING PROCESS
SF1
RECORD ALL PORTS (NODES) OF CONFIGURATION INFORMATION TABLE INTO STARTING POINT LIST
SF2
RECORD PORTS (NODES) IN SELF NODE INTO END POINT LIST
SF3
READ ONE SET OF END POINT PORTS (NODES) FROM END POINT LIST
SF4
READ ONE SET OF STARTING POINT PORTS (NODES) FROM STARTING POINT LIST
SF5
RETRIEVE STARTING POINT AND END POINT IN EXCHANGED MANNER FROM RECEPTION VIRTUAL PATH LIST
SF6
ENTRY DISTRIBUTED?
No
Yes
SF7
RETRIEVE STARTING POINT AND END POINT IN EXCHANGED MANNER FROM TRANSMISSION VIRTUAL PATH LIST
SF8
TRANSMISSION VIRTUAL PATH IDENTIFIER IS PRESENT IN ENTRY?
No
Yes
SF9
SET USABLE FLAGS OF ENTRY IN RECEPTION VIRTUAL PATH LIST AND TRANSMISSION VIRTUAL PATH LIST (SET TO 1)
SF10
PROCEED POINTER OF STARTING POINT LIST TO THE NEXT
SF11
POINTER OF STARTING POINT LIST IS LAST ?
No
Yes
SF12
PROCEED POINTER OF END POINT LIST
SF13
POINTER OF END POINT LIST IS LAST?
No
Yes
RETURN

FIG.17

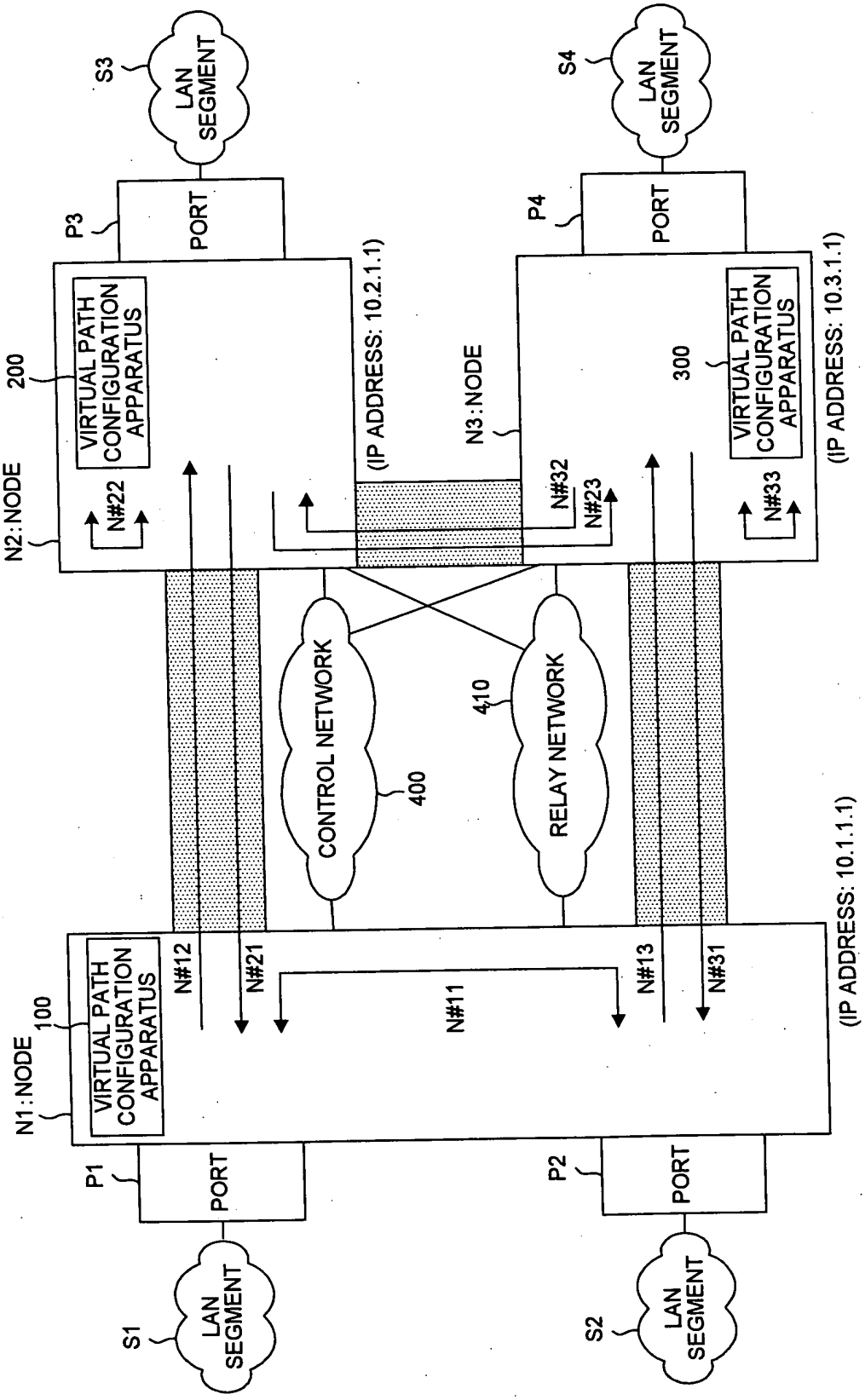

S3
LAN SEGMENT
S4
LAN SEGMENT
P3
PORT
P4
PORT
200
VIRTUAL PATH CONFIGURATION APPARATUS
300
VIRTUAL PATH CONFIGURATION APPARATUS
N2:NODE
N#22
(IP ADDRESS: 10.2.1.1)
N3:NODE
N#32
N#23
N#33
(IP ADDRESS: 10.3.1.1)
CONTROL NETWORK
400
410
RELAY NETWORK
100
VIRTUAL PATH CONFIGURATION APPARATUS
N1:NODE
N#12
N#21
N#11
N#13
N#31
(IP ADDRESS: 10.1.1.1)
P1
PORT
P2
PORT
S1
LAN SEGMENT
S2
LAN SEGMENT

FIG.18A

120': CONFIGURATION INFORMATION TABLE

NODE
N1(10.1.1.1)
N1(10.1.1.1)
N2(10.2.1.1)
N3(10.3.1.1)

FIG.18B

220': CONFIGURATION INFORMATION TABLE

NODE
N1(10.1.1.1)
N1(10.1.1.1)
N2(10.2.1.1)
N3(10.3.1.1)

FIG.18C

320': CONFIGURATION INFORMATION TABLE

NODE
N1(10.1.1.1)
N1(10.1.1.1)
N2(10.2.1.1)
N3(10.3.1.1)

FIG.19

142'

142R'

RECEPTION VIRTUAL PATH	STARTING POINT NODE	END POINT NODE
N#11	N1(10.1.1.1)	N1(10.1.1.1)
N#21	N2(10.2.1.1)	N1(10.1.1.1)
N#31	N3(10.3.1.1)	N1(10.1.1.1)

142S'

STARTING POINT NODE	END POINT NODE	TRANSMISSION VIRTUAL PATH
N1(10.1.1.1)	N1(10.1.1.1)	N#11
N1(10.1.1.1)	N2(10.2.1.1)	N#12
N1(10.1.1.1)	N3(10.3.1.1)	N#13

FIG.20

242'

242R'

RECEPTION VIRTUAL PATH	STARTING POINT NODE	END POINT NODE
N#12	N1(10.1.1.1)	N2(10.2.1.1)
N#22	N2(10.2.1.1)	N2(10.2.1.1)
N#32	N3(10.3.1.1)	N2(10.2.1.1)

242S'

STARTING POINT NODE	END POINT NODE	TRANSMISSION VIRTUAL PATH
N2(10.2.1.1)	N1(10.1.1.1)	N#21
N2(10.2.1.1)	N2(10.2.1.1)	N#22
N2(10.2.1.1)	N3(10.3.1.1)	N#23

FIG.21

342'

342R'

RECEPTION VIRTUAL PATH	STARTING POINT NODE	END POINT NODE
N#13	N1(10.1.1.1)	N3(10.3.1.1)
N#23	N2(10.2.1.1)	N3(10.3.1.1)
N#33	N3(10.3.1.1)	N3(10.3.1.1)

342S'

STARTING POINT NODE	END POINT NODE	TRANSMISSION VIRTUAL PATH
N3(10.3.1.1)	N1(10.1.1.1)	N#31
N3(10.3.1.1)	N2(10.2.1.1)	N#32
N3(10.3.1.1)	N3(10.3.1.1)	N#33

FIG.22

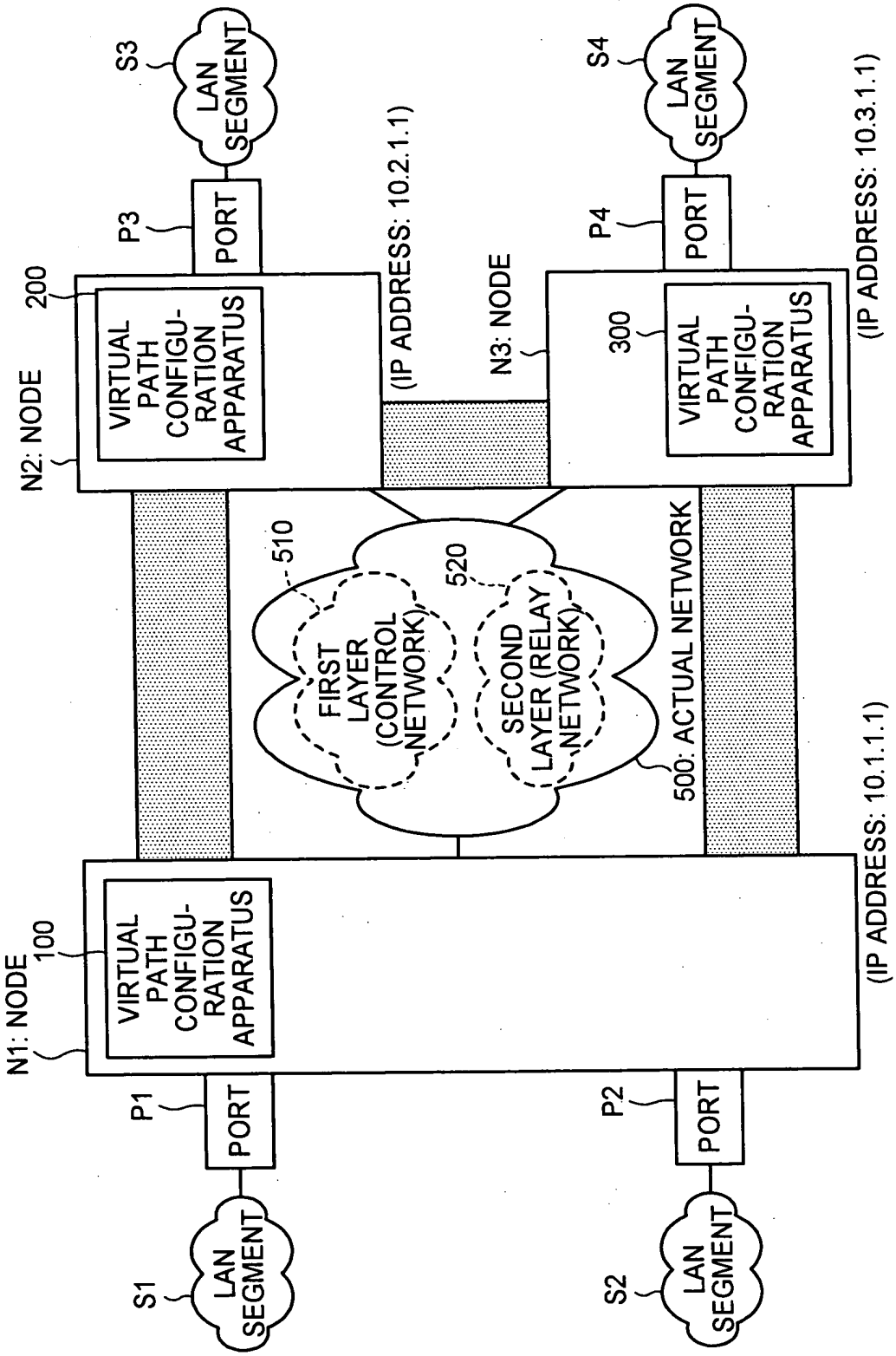

S1
LAN SEGMENT
P1
PORT
N1: NODE
100
VIRTUAL PATH CONFIGU-RATION APPARATUS
(IP ADDRESS: 10.1.1.1)
S2
LAN SEGMENT
P2
PORT
S3
LAN SEGMENT
P3
PORT
N2: NODE
200
VIRTUAL PATH CONFIGU-RATION APPARATUS
(IP ADDRESS: 10.2.1.1)
S4
LAN SEGMENT
P4
PORT
N3: NODE
300
VIRTUAL PATH CONFIGU-RATION APPARATUS
(IP ADDRESS: 10.3.1.1)
510
FIRST LAYER (CONTROL NETWORK)
520
SECOND LAYER (RELAY NETWORK)
500: ACTUAL NETWORK

FIG.23

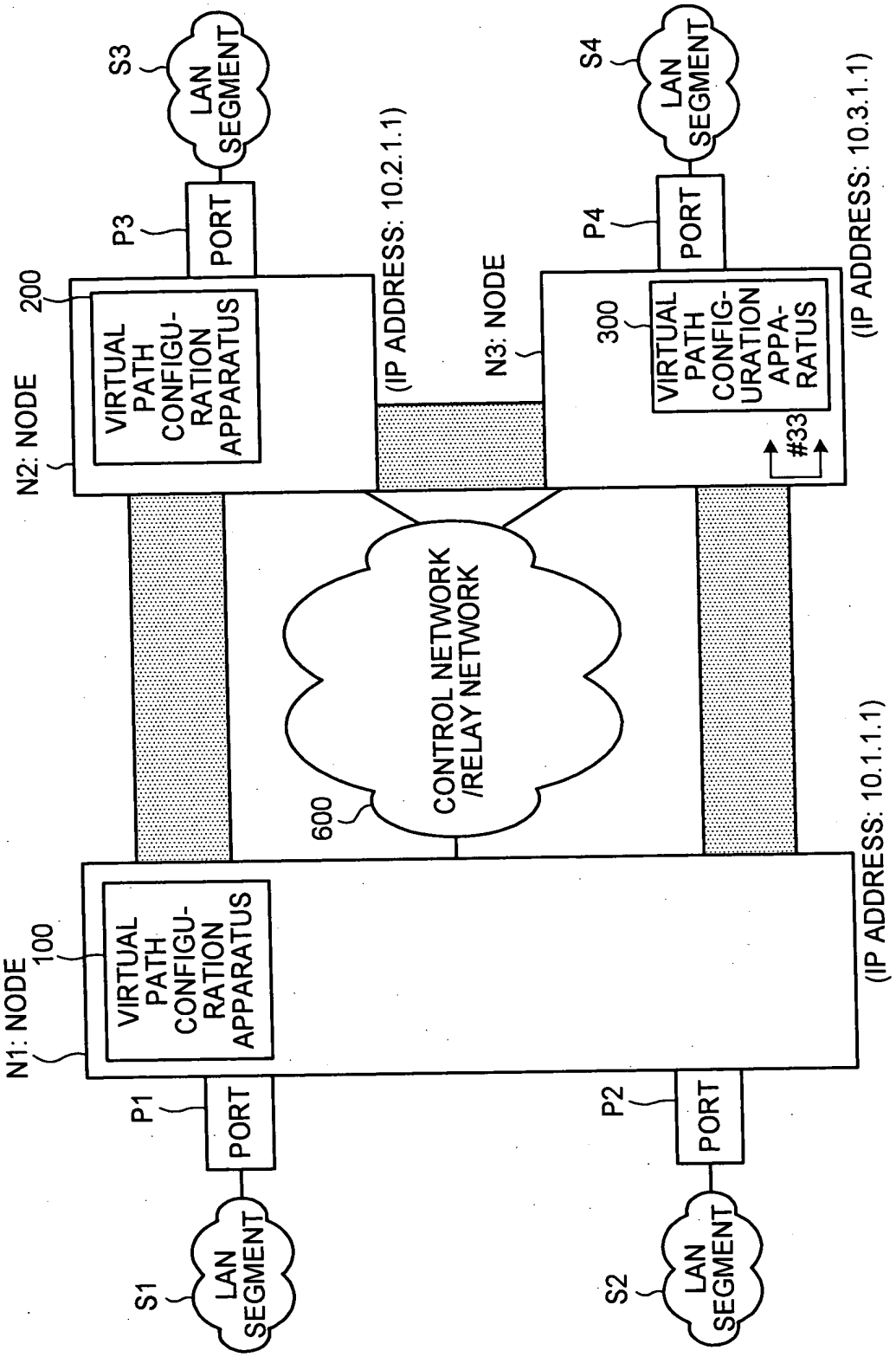

S3
LAN SEGMENT
P3
PORT
200
VIRTUAL PATH CONFIGU-RATION APPARATUS
N2: NODE
(IP ADDRESS: 10.2.1.1)
S4
LAN SEGMENT
P4
PORT
300
VIRTUAL PATH CONFIG-URATION APPA-RATUS
#33
N3: NODE
(IP ADDRESS: 10.3.1.1)
CONTROL NETWORK /RELAY NETWORK
600
N1: NODE
100
VIRTUAL PATH CONFIGU-RATION APPARATUS
(IP ADDRESS: 10.1.1.1)
P1
PORT
S1
LAN SEGMENT
P2
PORT
S2
LAN SEGMENT

FIG.24

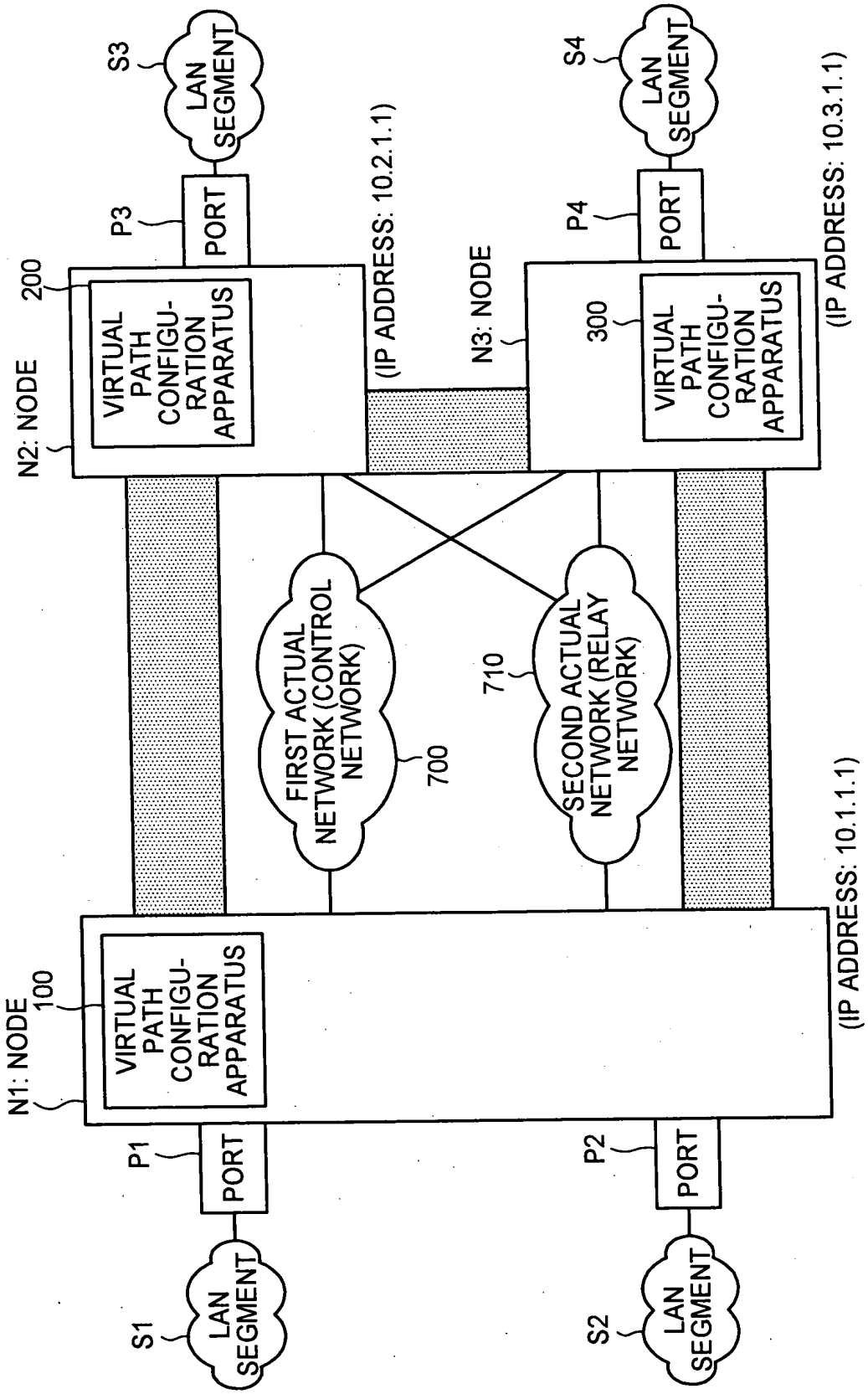

N1: NODE
100
VIRTUAL PATH CONFIGU-RATION APPARATUS
(IP ADDRESS: 10.1.1.1)
P1
PORT
S1
LAN SEGMENT
P2
PORT
S2
LAN SEGMENT
N2: NODE
200
VIRTUAL PATH CONFIGU-RATION APPARATUS
(IP ADDRESS: 10.2.1.1)
P3
PORT
S3
LAN SEGMENT
N3: NODE
300
VIRTUAL PATH CONFIGU-RATION APPARATUS
(IP ADDRESS: 10.3.1.1)
P4
PORT
S4
LAN SEGMENT
FIRST ACTUAL NETWORK (CONTROL NETWORK)
700
SECOND ACTUAL NETWORK (RELAY NETWORK)
710

FIG.25

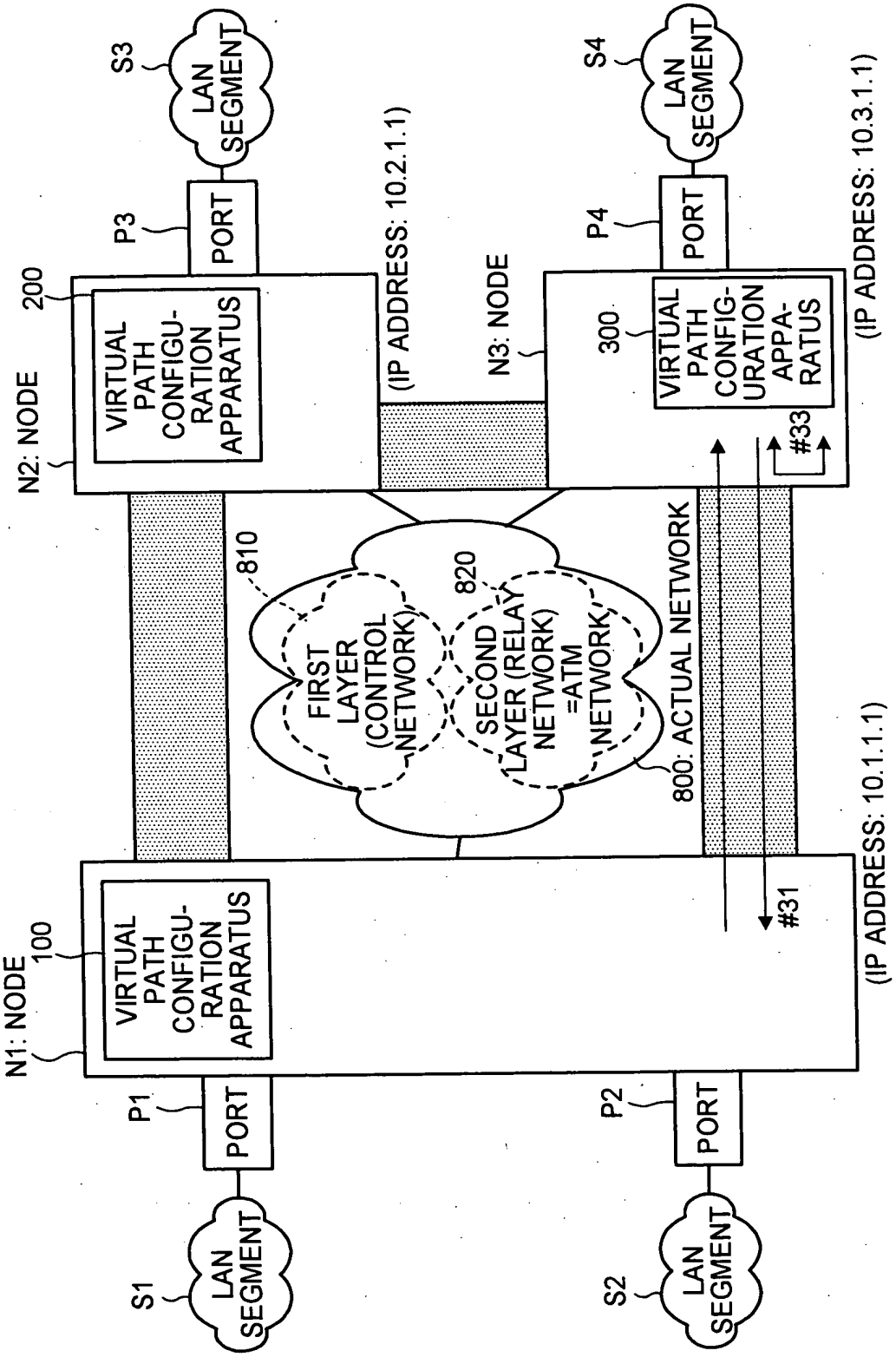

S1
LAN SEGMENT
S2
LAN SEGMENT
S3
LAN SEGMENT
S4
LAN SEGMENT
P1
PORT
P2
PORT
P3
PORT
P4
PORT
N1: NODE
100
VIRTUAL PATH CONFIGU-RATION APPARATUS
N2: NODE
200
VIRTUAL PATH CONFIGU-RATION APPARATUS
N3: NODE
300
VIRTUAL PATH CONFIG-URATION APPA-RATUS
(IP ADDRESS: 10.1.1.1)
(IP ADDRESS: 10.2.1.1)
(IP ADDRESS: 10.3.1.1)
#31
#33
810
FIRST LAYER (CONTROL NETWORK)
820
SECOND LAYER (RELAY NETWORK) =ATM NETWORK
800: ACTUAL NETWORK

FIG.26

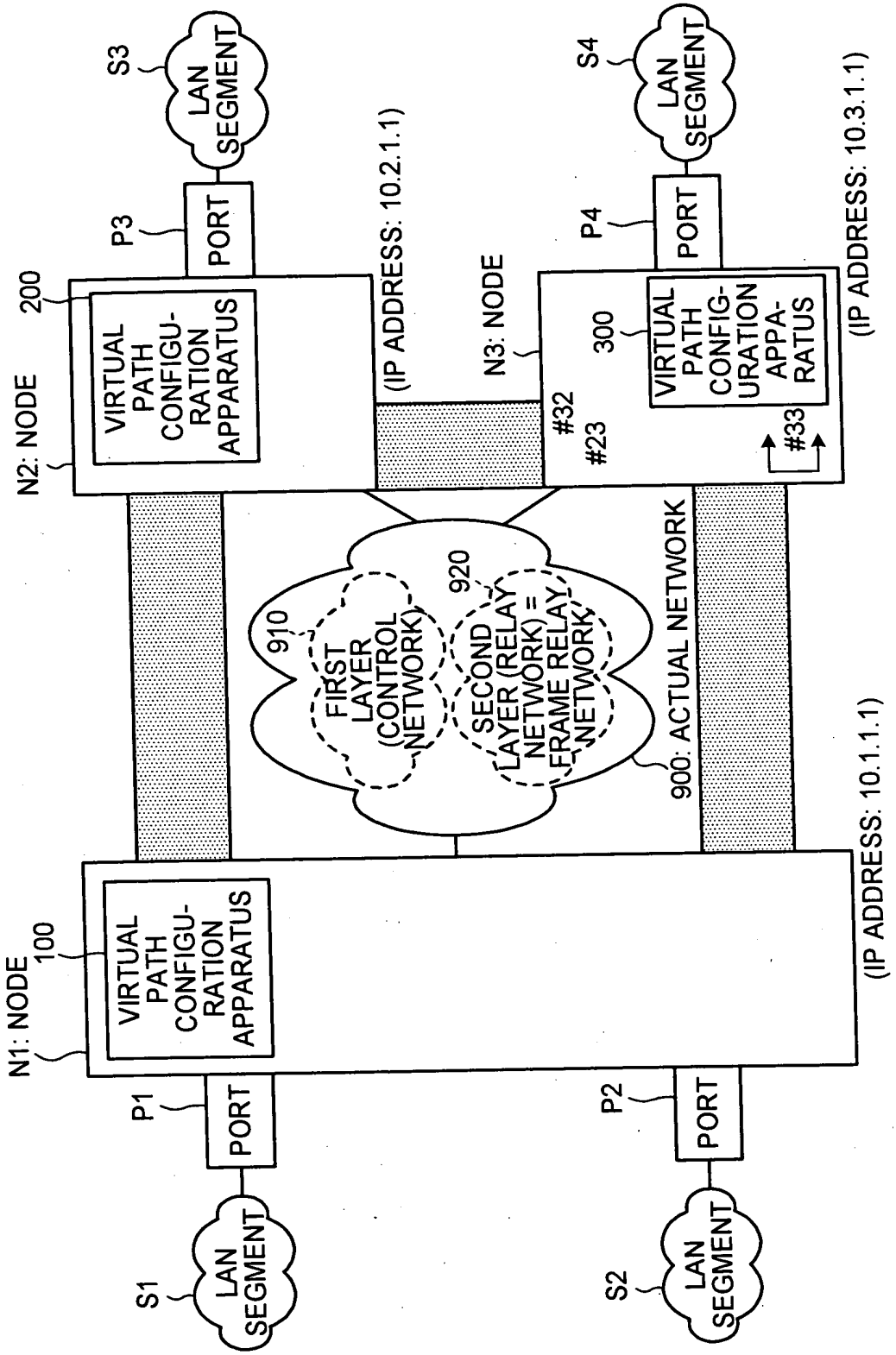

N1: NODE
100
VIRTUAL PATH CONFIGU-RATION APPARATUS
P1
PORT
S1
LAN SEGMENT
P2
PORT
S2
LAN SEGMENT
(IP ADDRESS: 10.1.1.1)
N2: NODE
200
VIRTUAL PATH CONFIGU-RATION APPARATUS
P3
PORT
S3
LAN SEGMENT
(IP ADDRESS: 10.2.1.1)
N3: NODE
300
VIRTUAL PATH CONFIG-URATION APPA-RATUS
#32
#23
#33
P4
PORT
S4
LAN SEGMENT
(IP ADDRESS: 10.3.1.1)
900: ACTUAL NETWORK
910
FIRST LAYER (CONTROL NETWORK)
920
SECOND LAYER (RELAY NETWORK) = FRAME RELAY NETWORK

FIG.27

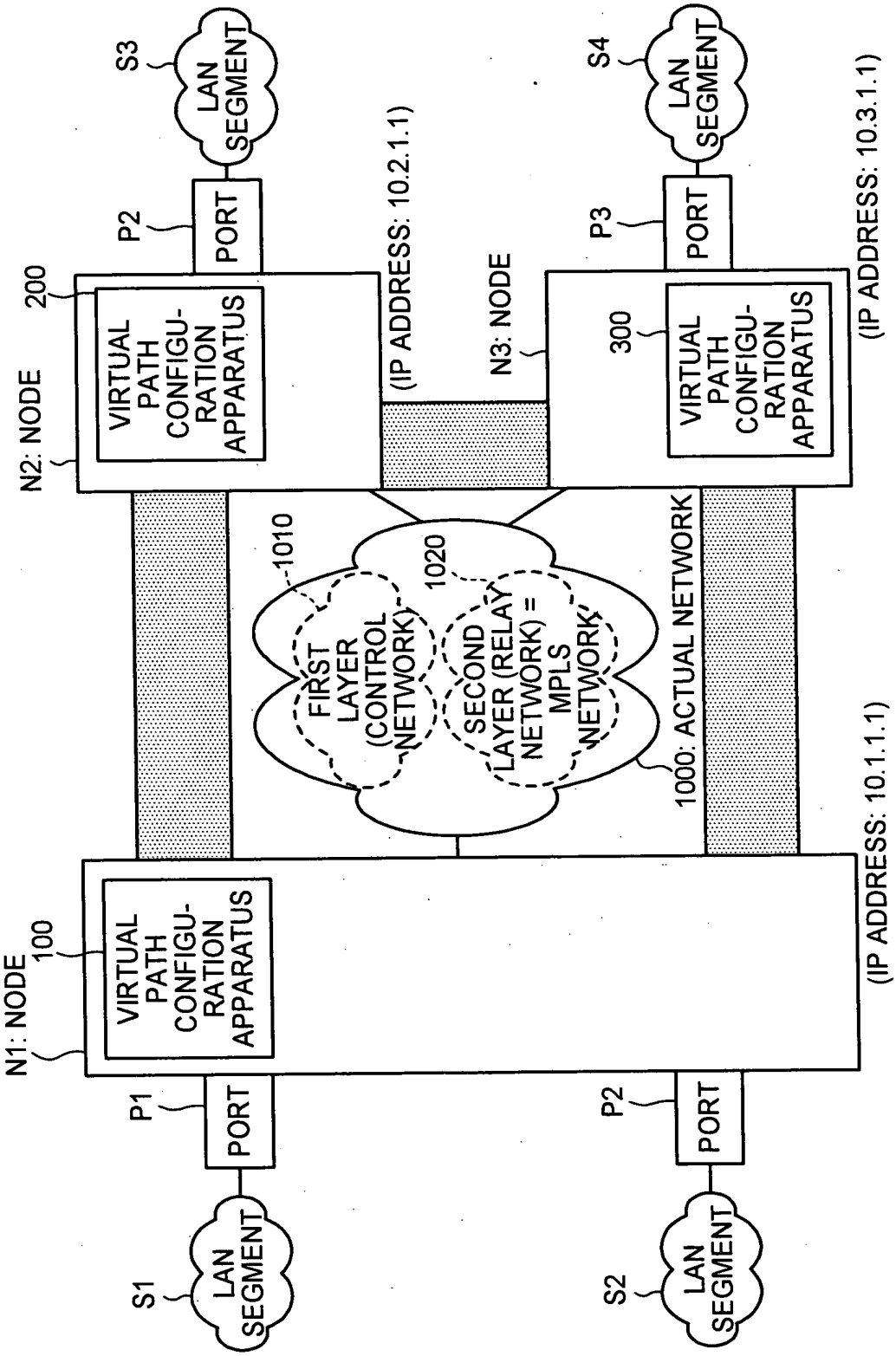

S1
LAN SEGMENT
P1
PORT
N1: NODE
100
VIRTUAL PATH CONFIGU-RATION APPARATUS
S2
LAN SEGMENT
P2
PORT
(IP ADDRESS: 10.1.1.1)
S3
LAN SEGMENT
P2
PORT
N2: NODE
200
VIRTUAL PATH CONFIGU-RATION APPARATUS
(IP ADDRESS: 10.2.1.1)
S4
LAN SEGMENT
P3
PORT
N3: NODE
300
VIRTUAL PATH CONFIGU-RATION APPARATUS
(IP ADDRESS: 10.3.1.1)
1010
FIRST LAYER (CONTROL NETWORK)
1020
SECOND LAYER (RELAY NETWORK) = MPLS NETWORK
1000: ACTUAL NETWORK

FIG.28

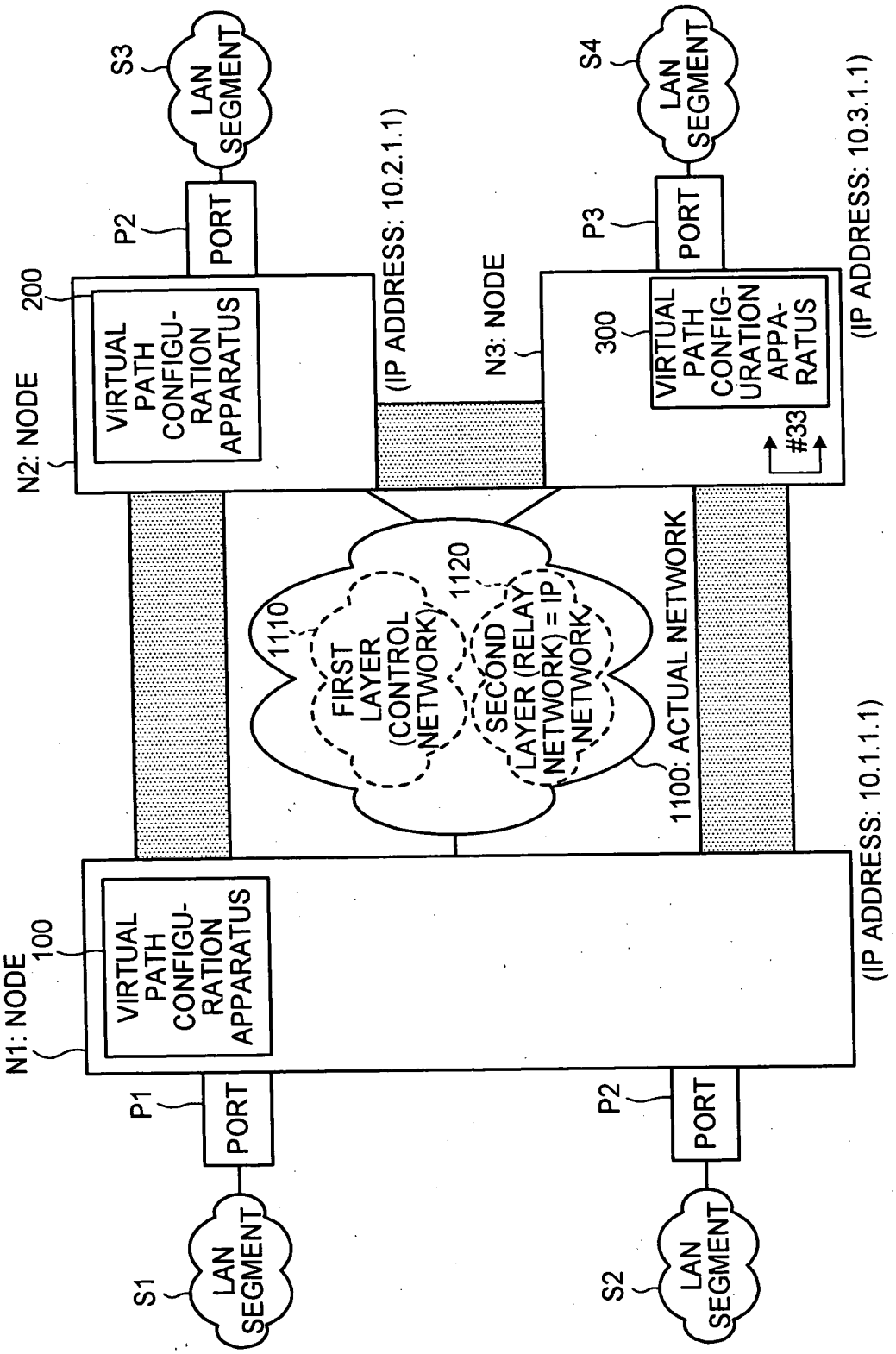

S1
LAN SEGMENT
S2
LAN SEGMENT
S3
LAN SEGMENT
S4
LAN SEGMENT
P1
PORT
P2
PORT
P2
PORT
P3
PORT
N1: NODE
100
VIRTUAL PATH CONFIGU-RATION APPARATUS
N2: NODE
200
VIRTUAL PATH CONFIGU-RATION APPARATUS
N3: NODE
300
VIRTUAL PATH CONFIG-URATION APPA-RATUS
#33
(IP ADDRESS: 10.1.1.1)
(IP ADDRESS: 10.2.1.1)
(IP ADDRESS: 10.3.1.1)
1100: ACTUAL NETWORK
1110
FIRST LAYER (CONTROL NETWORK)
1120
SECOND LAYER (RELAY NETWORK) = IP NETWORK

FIG.29

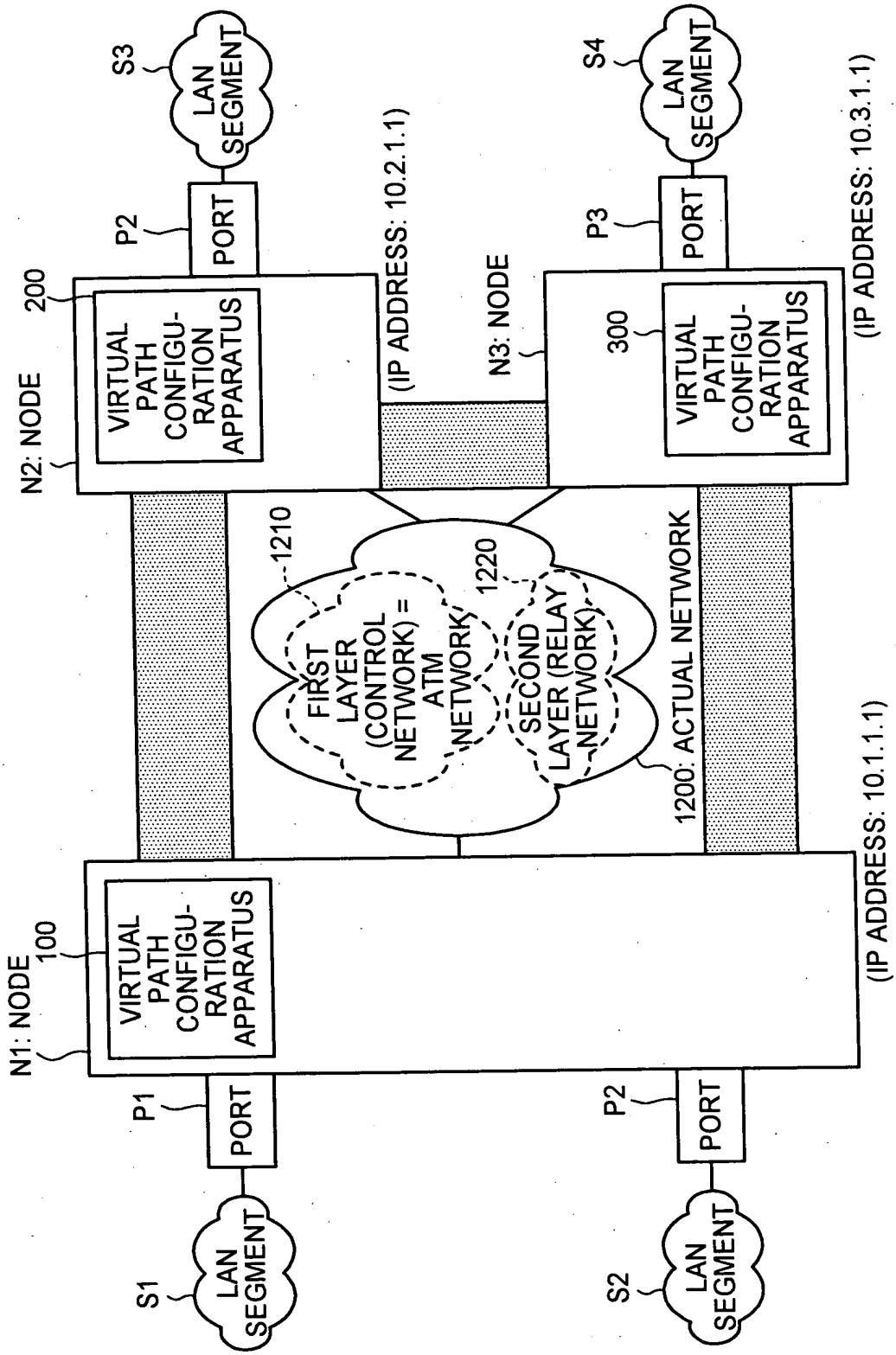

N1: NODE
100
VIRTUAL PATH CONFIGU-RATION APPARATUS
P1
PORT
S1
LAN SEGMENT
P2
PORT
S2
LAN SEGMENT
(IP ADDRESS: 10.1.1.1)
1200: ACTUAL NETWORK
1210
FIRST LAYER (CONTROL NETWORK) = ATM NETWORK
1220
SECOND LAYER (RELAY NETWORK)
N2: NODE
200
VIRTUAL PATH CONFIGU-RATION APPARATUS
P2
PORT
S3
LAN SEGMENT
(IP ADDRESS: 10.2.1.1)
N3: NODE
300
VIRTUAL PATH CONFIGU-RATION APPARATUS
P3
PORT
S4
LAN SEGMENT
(IP ADDRESS: 10.3.1.1)

FIG.30

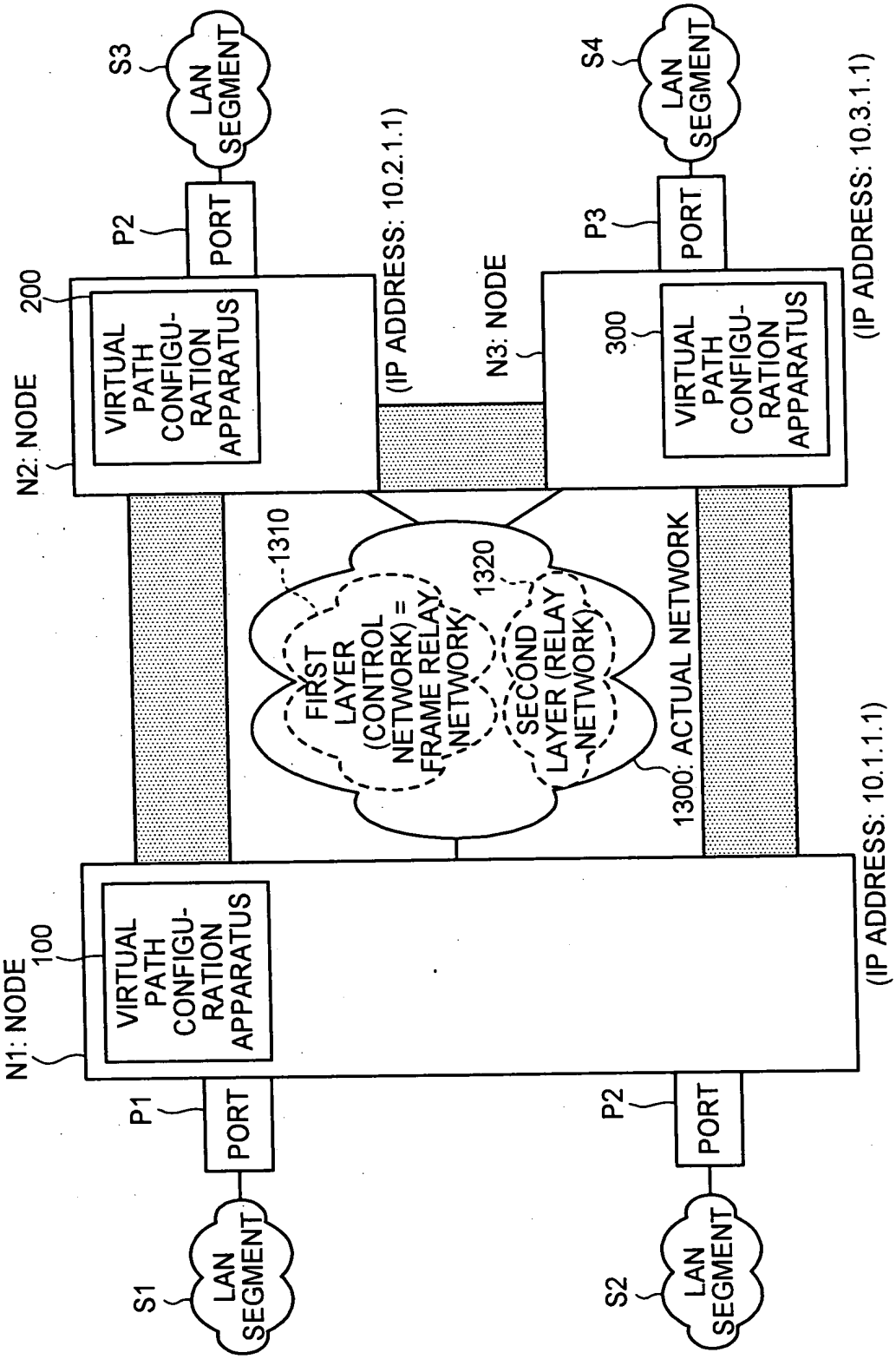

S1
LAN SEGMENT
P1
PORT
N1: NODE
100
VIRTUAL PATH CONFIGU-RATION APPARATUS
(IP ADDRESS: 10.1.1.1)
S2
LAN SEGMENT
P2
PORT
S3
LAN SEGMENT
P2
PORT
N2: NODE
200
VIRTUAL PATH CONFIGU-RATION APPARATUS
(IP ADDRESS: 10.2.1.1)
N3: NODE
S4
LAN SEGMENT
P3
PORT
300
VIRTUAL PATH CONFIGU-RATION APPARATUS
(IP ADDRESS: 10.3.1.1)
1310
FIRST LAYER (CONTROL NETWORK) = FRAME RELAY NETWORK
1320
SECOND LAYER (RELAY NETWORK)
1300: ACTUAL NETWORK

FIG.31

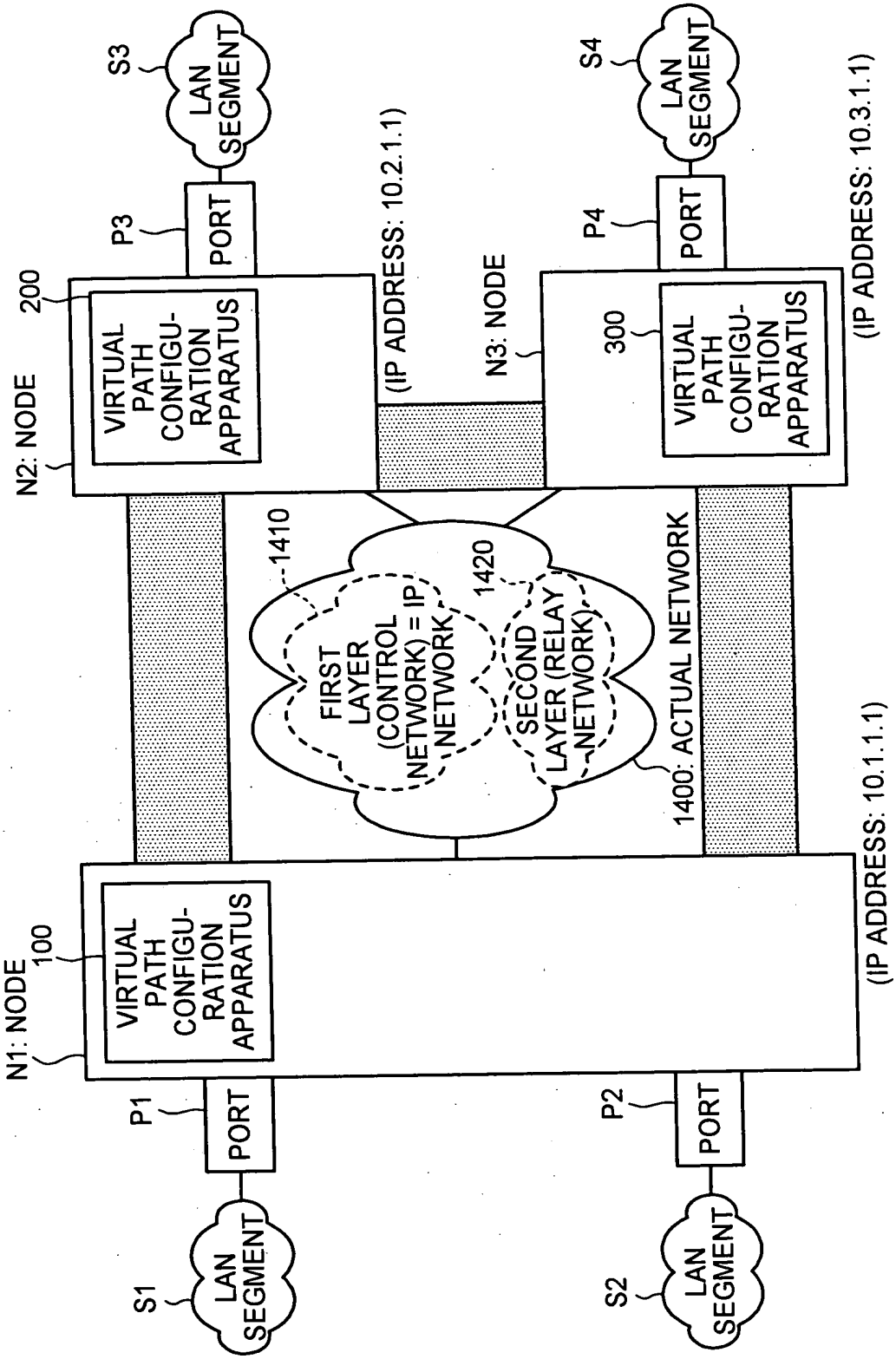

N1: NODE
100
VIRTUAL PATH CONFIGU-RATION APPARATUS
P1
PORT
S1
LAN SEGMENT
P2
PORT
S2
LAN SEGMENT
(IP ADDRESS: 10.1.1.1)
N2: NODE
200
VIRTUAL PATH CONFIGU-RATION APPARATUS
P3
PORT
S3
LAN SEGMENT
(IP ADDRESS: 10.2.1.1)
N3: NODE
300
VIRTUAL PATH CONFIGU-RATION APPARATUS
P4
PORT
S4
LAN SEGMENT
(IP ADDRESS: 10.3.1.1)
1400: ACTUAL NETWORK
1410
FIRST LAYER (CONTROL NETWORK) = IP NETWORK
1420
SECOND LAYER (RELAY NETWORK)

FIG.32

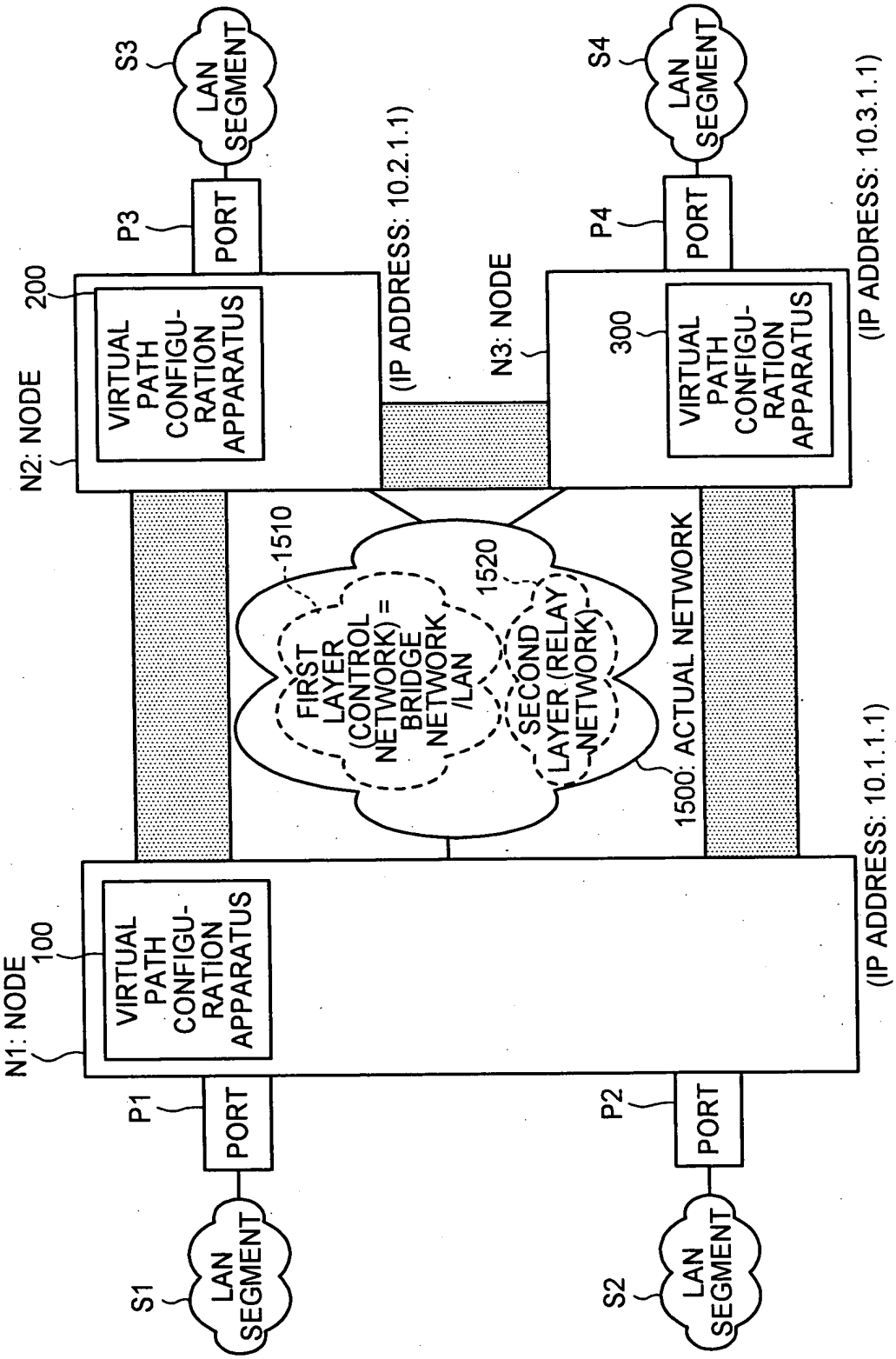

N1: NODE
100
VIRTUAL PATH CONFIGU-RATION APPARATUS
N2: NODE
200
VIRTUAL PATH CONFIGU-RATION APPARATUS
N3: NODE
300
VIRTUAL PATH CONFIGU-RATION APPARATUS
P1
PORT
P2
PORT
P3
PORT
P4
PORT
S1
LAN SEGMENT
S2
LAN SEGMENT
S3
LAN SEGMENT
S4
LAN SEGMENT
(IP ADDRESS: 10.1.1.1)
(IP ADDRESS: 10.2.1.1)
(IP ADDRESS: 10.3.1.1)
1500: ACTUAL NETWORK
1510
FIRST LAYER (CONTROL NETWORK) = BRIDGE NETWORK /LAN
1520
SECOND LAYER (RELAY NETWORK)

FIG.33

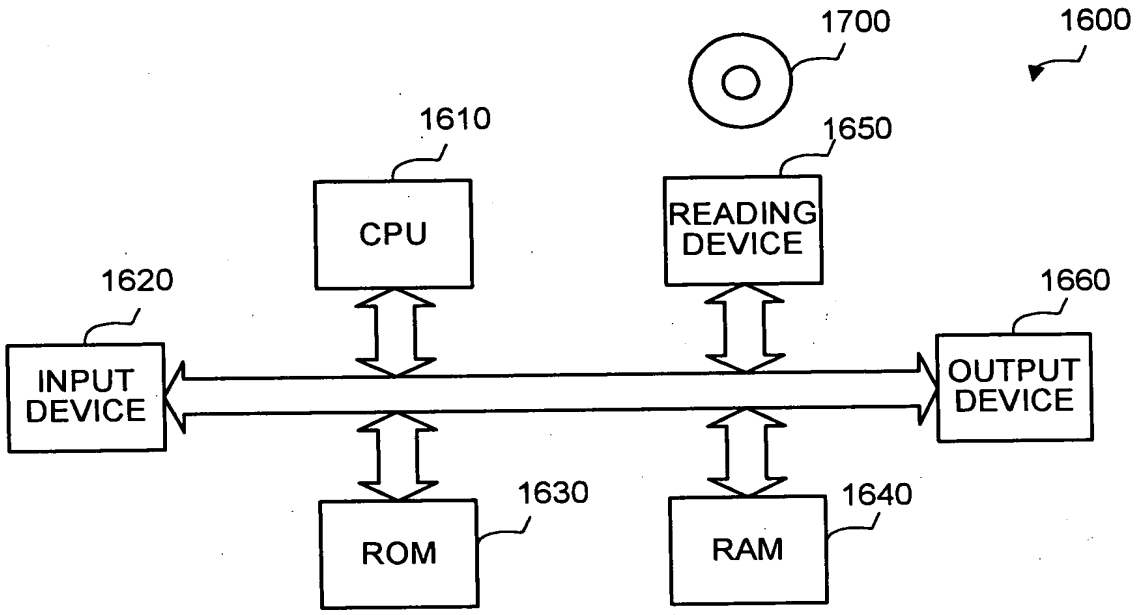
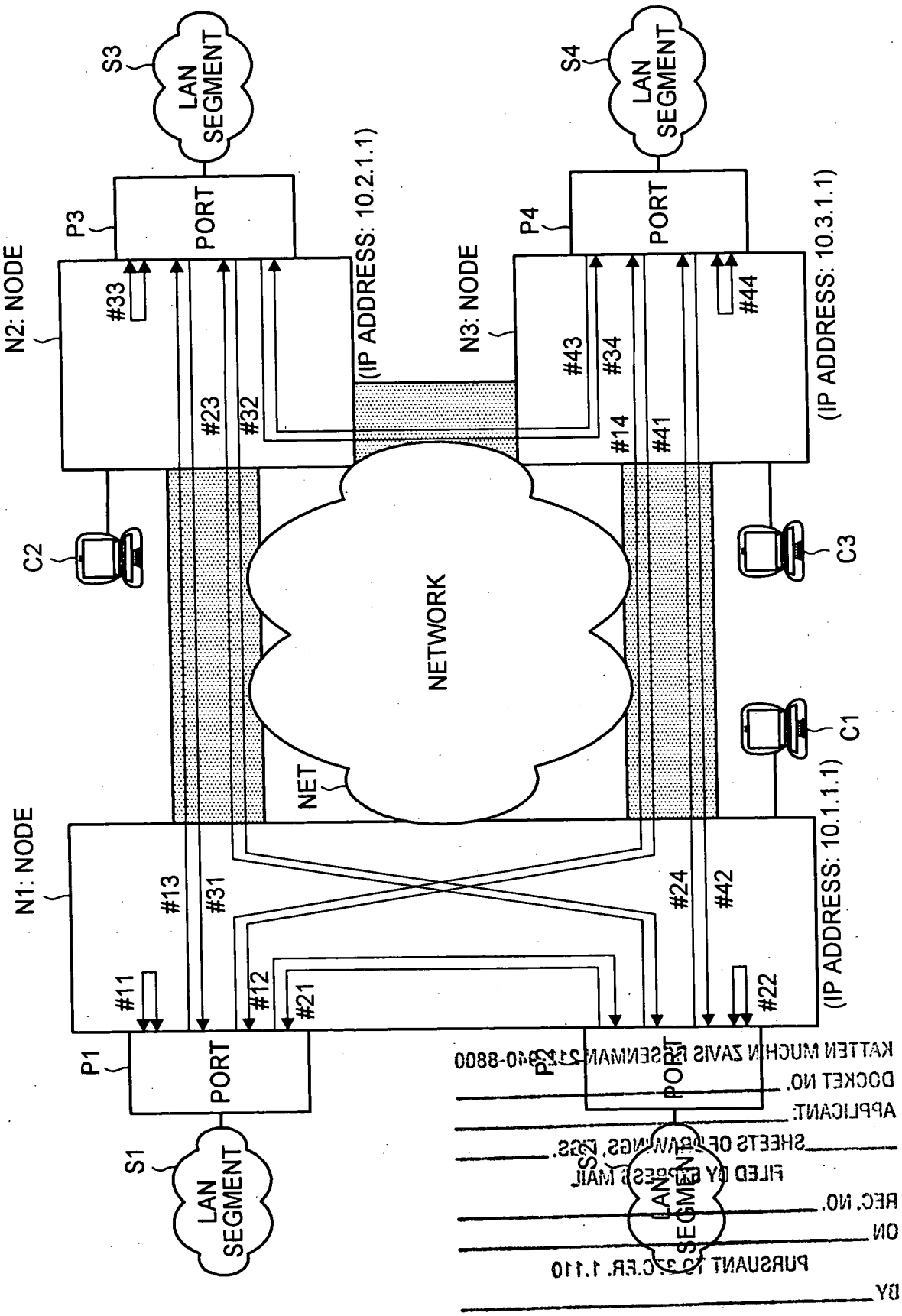

1700
1600
1610
1650
CPU
READING DEVICE
1620
1660
INPUT DEVICE
OUTPUT DEVICE
1630
1640
ROM
RAM

FIG.34


S3
LAN SEGMENT
S4
LAN SEGMENT
P3
PORT
P4
PORT
N2: NODE
(IP ADDRESS: 10.2.1.1)
N3: NODE
(IP ADDRESS: 10.3.1.1)
#33
#23
#32
#43
#34
#14
#41
#44
C2
C3
NETWORK
NET
C1
N1: NODE
(IP ADDRESS: 10.1.1.1)
#13
#31
#24
#42
#11
#12
#21
#22
P1
PORT
P2
PORT
S1
LAN SEGMENT
S2
LAN SEGMENT